GOES-16 Operational Applications
Conversations With Users

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2017 NOAA Satellite Conference
July 17, 2017

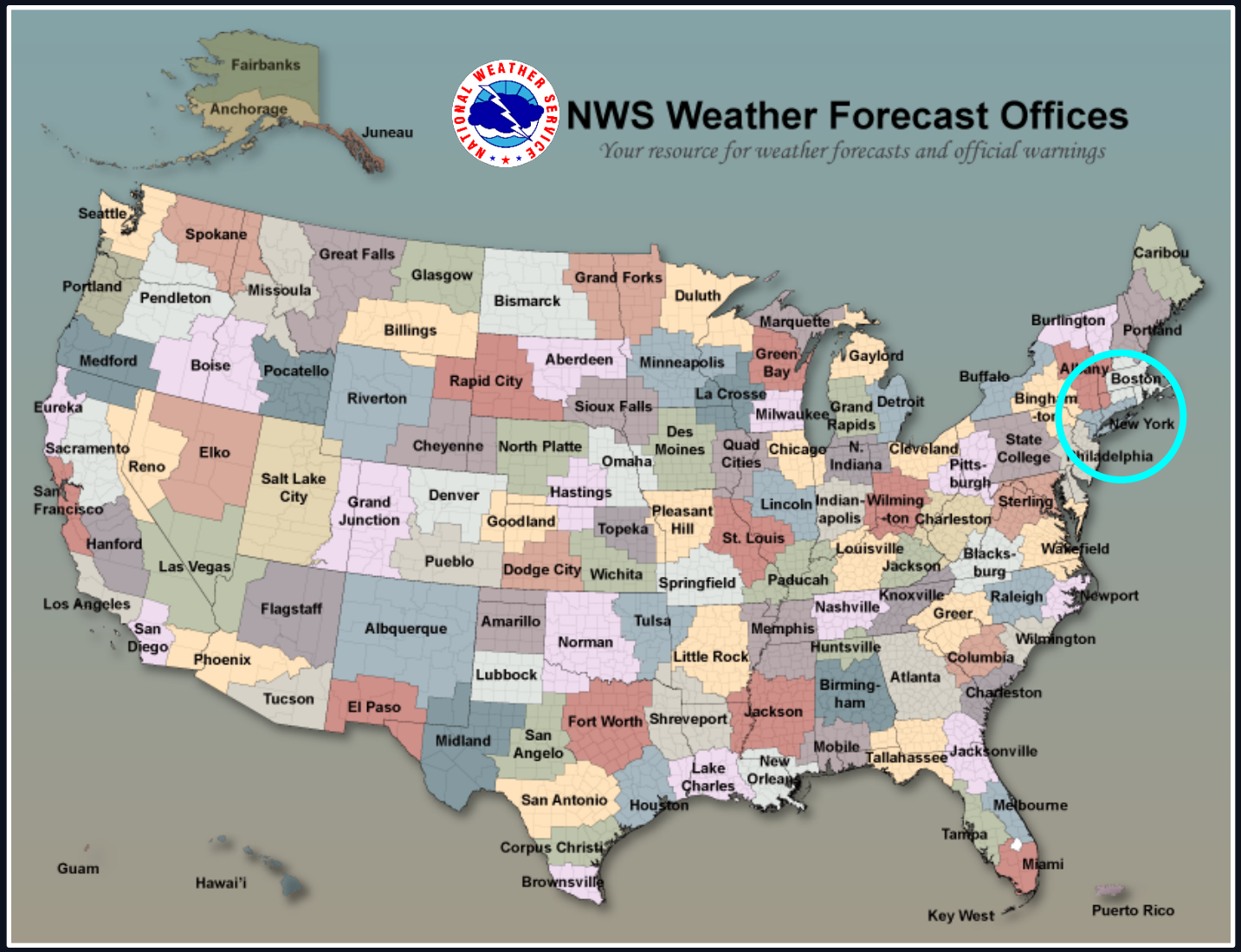
GOES-16 Operational Applications
Conversations With Users

Purpose: Six operational applications of GOES-16 focused on use for short-term forecasts, warning decisions, and impact-based decision support services.

Format: Each case will be presented in 5 minutes followed by 5 minutes of Q&A discussion.

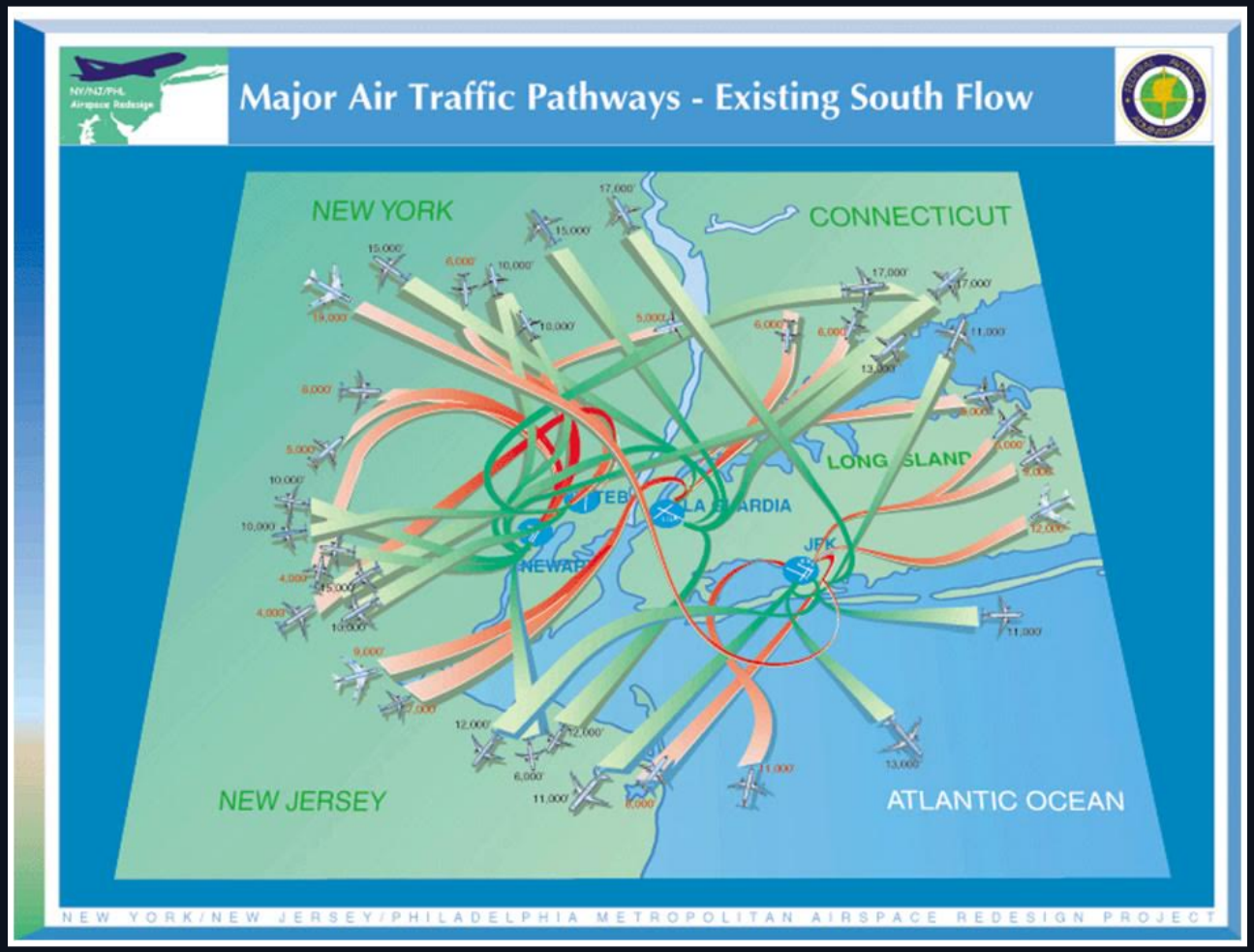
YOUR participation is encouraged!

1. Aviation Forecasting: New York City, NY NWS Forecast Office



Aviation Forecasting – 5 July 2017

The New York City airspace is among the most congested in the world.

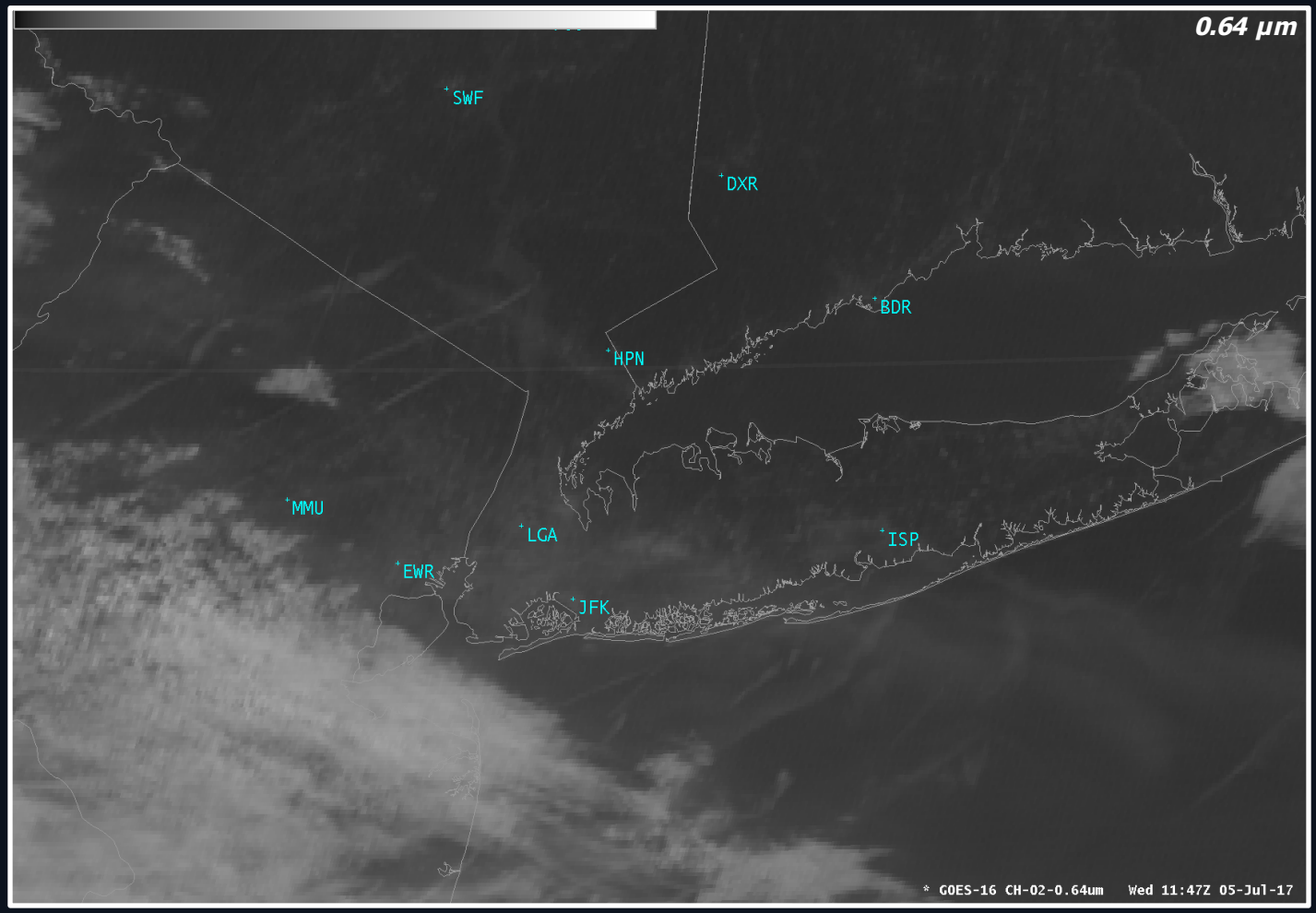


The U.S.'s National Airspace System (NAS) is frequently, almost daily, impacted by weather that causes delays that can snowball throughout the NAS.

Aviation Forecasting – 5 July 2017 1147 UTC

"Clear and a Million" Day

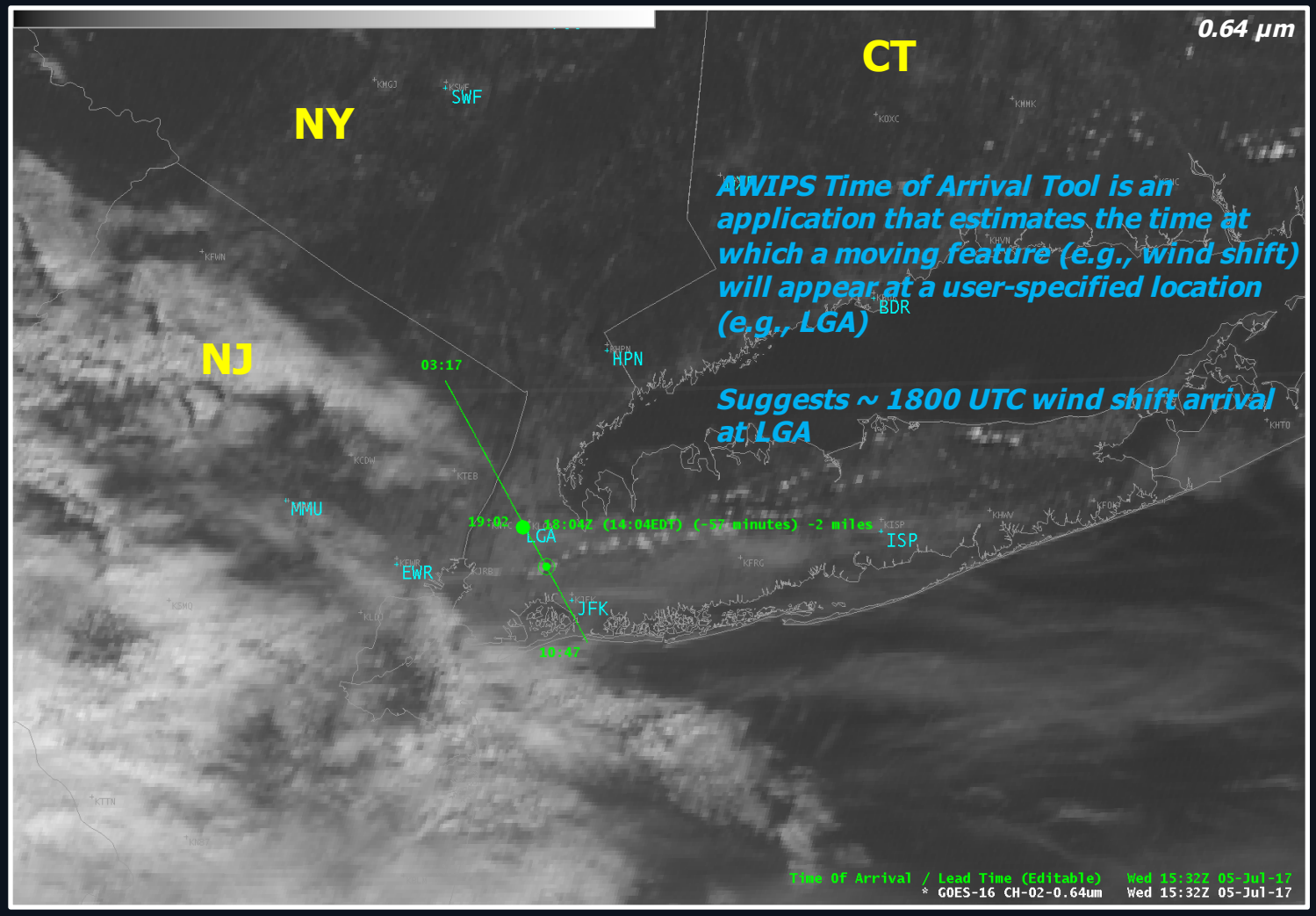
METAR KLGA 051151Z 05006KT 10SM SCT250 22/16 A3019



A well forecast wind shift can mitigate delays that can result in saving thousands, if not millions, of dollars.

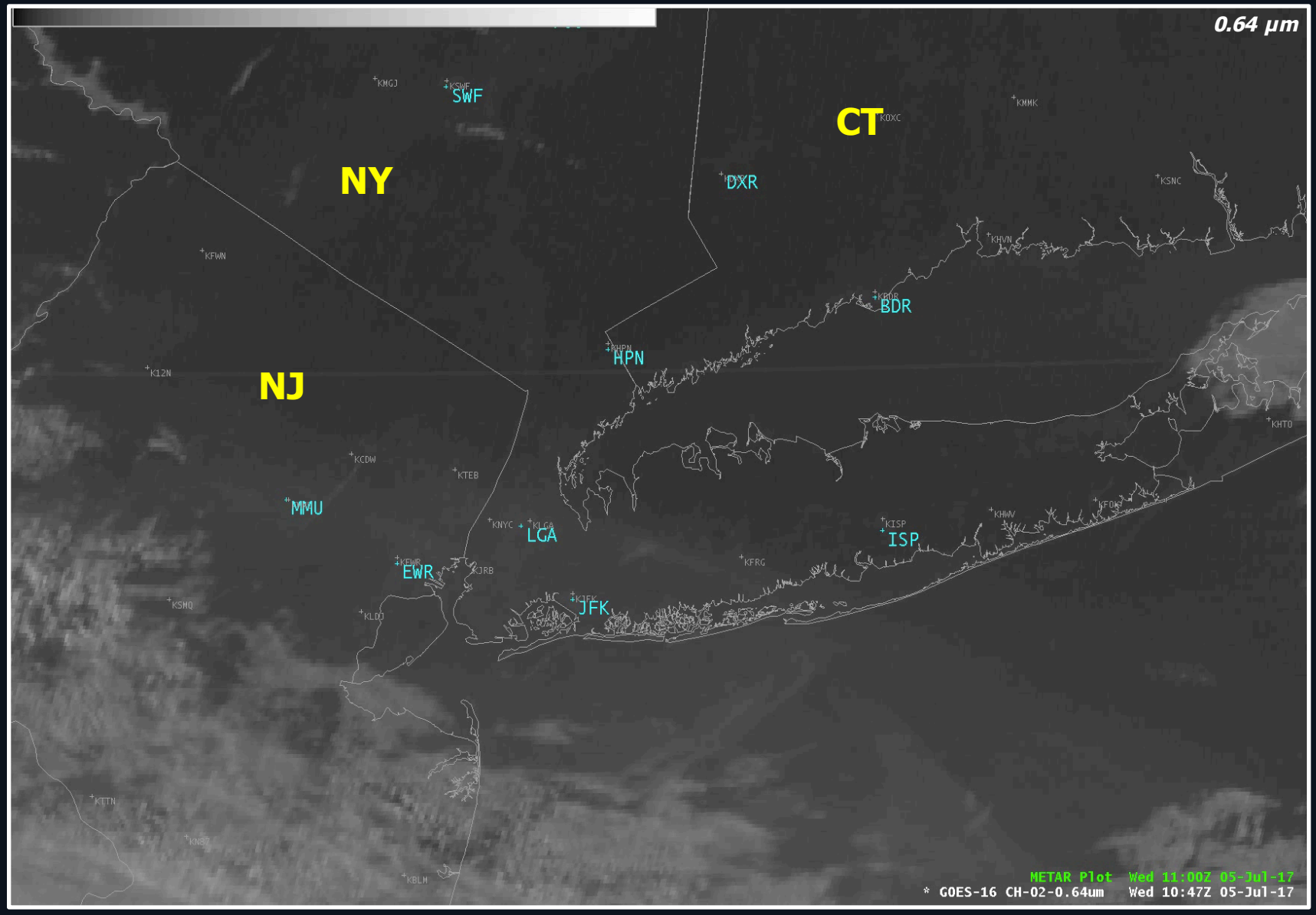
Aviation Forecasting – 5 July 2017 1532 UTC

AWIPS Time of Arrival Tool with GOES-16 Imagery



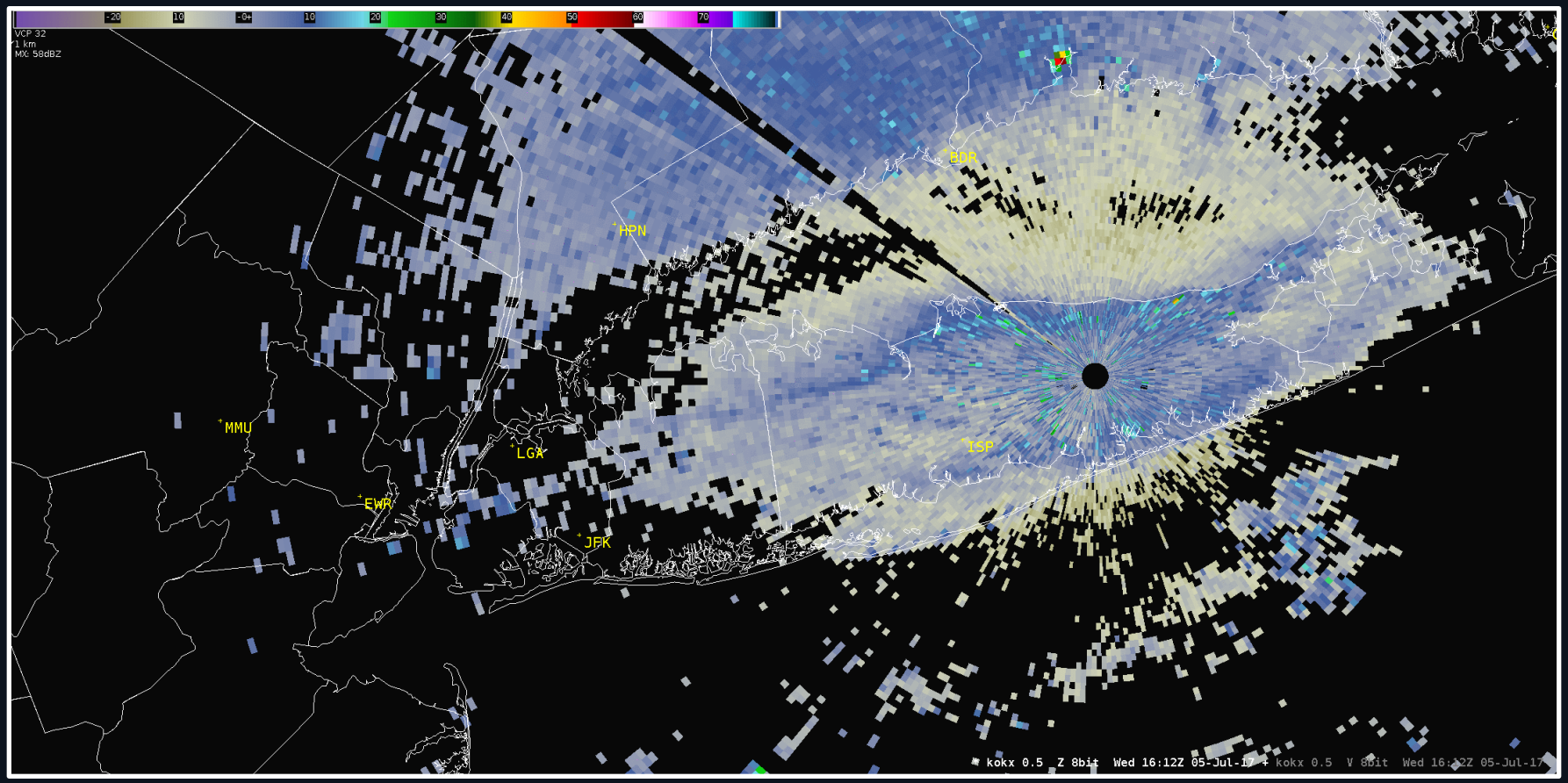
A well forecast wind shift can mitigate delays that can result in saving thousands, if not millions, of dollars.

Aviation Forecasting – 5 July 2017 1047-1832 UTC



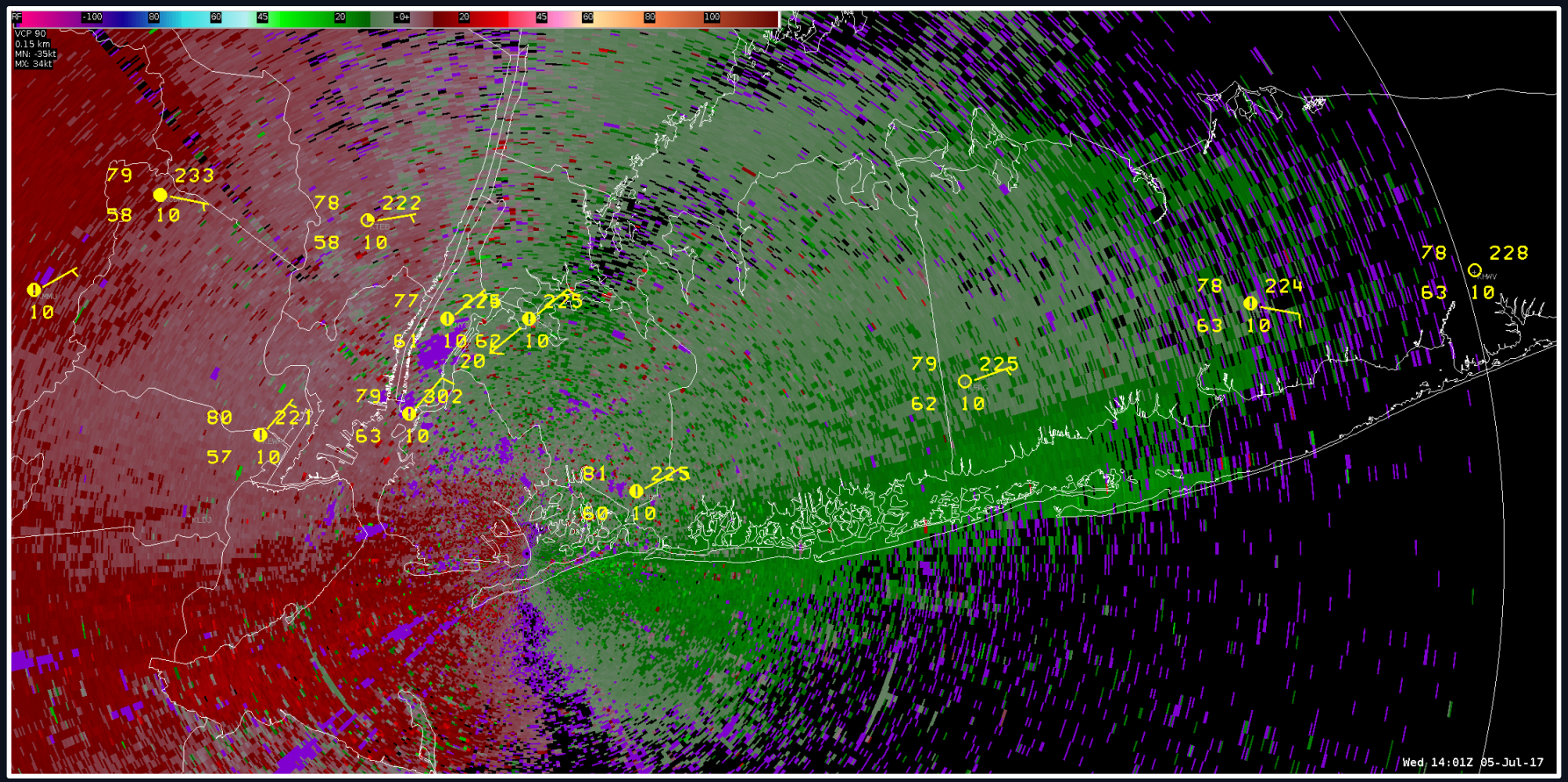
Aviation Forecasting – 5 July 2017 1612-1949 UTC

WSR-88D KOKX 0.5° Reflectivity



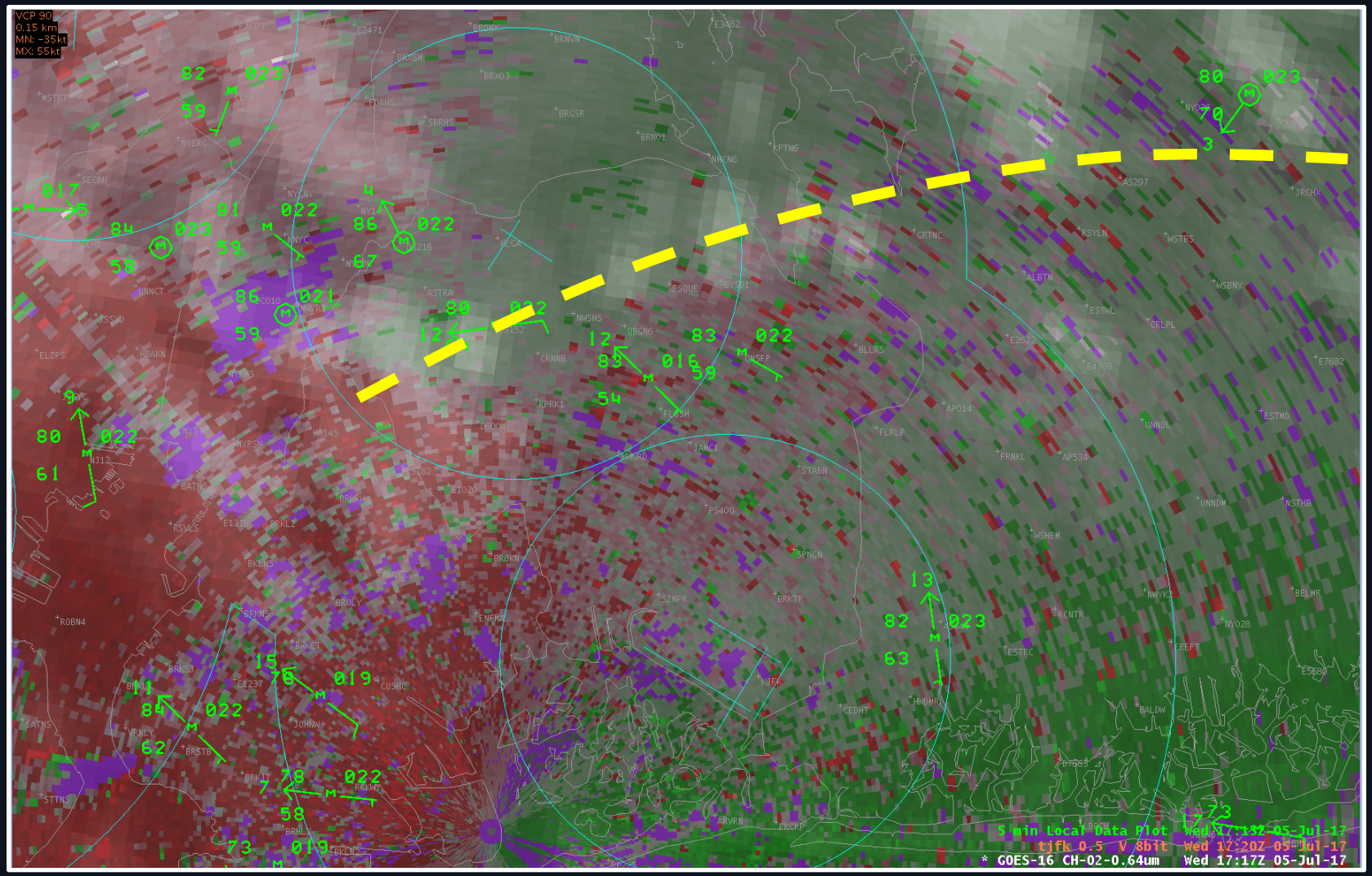
Aviation Forecasting – 5 July 2017 1401-1956 UTC

TJFK 0.5° Velocity



New combined visualization techniques in AWIPS...

TJFK 0.5° Velocity and GOES-16 0.64 µm Merge



Aviation Forecasting – 5 July 2017

METAR KLGA 051800Z AUTO 05011KT 10SM SCT070 27/19 A3018
METAR KLGA 051805Z AUTO 05010KT 10SM SCT070 27/19 A3018
METAR KLGA 051810Z AUTO 04011KT 10SM SCT070 27/19 A3018
METAR KLGA 051815Z AUTO 05012KT 10SM SCT070 27/19 A3018
METAR KLGA 051820Z AUTO 05011KT 10SM SCT070 27/19 A3018
METAR KLGA 051825Z AUTO 04011KT 10SM SCT070 27/19 A3018
METAR KLGA 051830Z AUTO 11012KT 10SM SCT070 29/16 A3018
METAR KLGA 051835Z AUTO 14009KT 10SM SCT070 29/13 A3018
METAR KLGA 051840Z AUTO 11012G17KT 10SM SCT070 29/12 A3018
METAR KLGA 051845Z AUTO 11012KT 10SM SCT070 29/11 A3018
METAR KLGA 051850Z AUTO 14011KT 10SM FEW070 29/13 A3018
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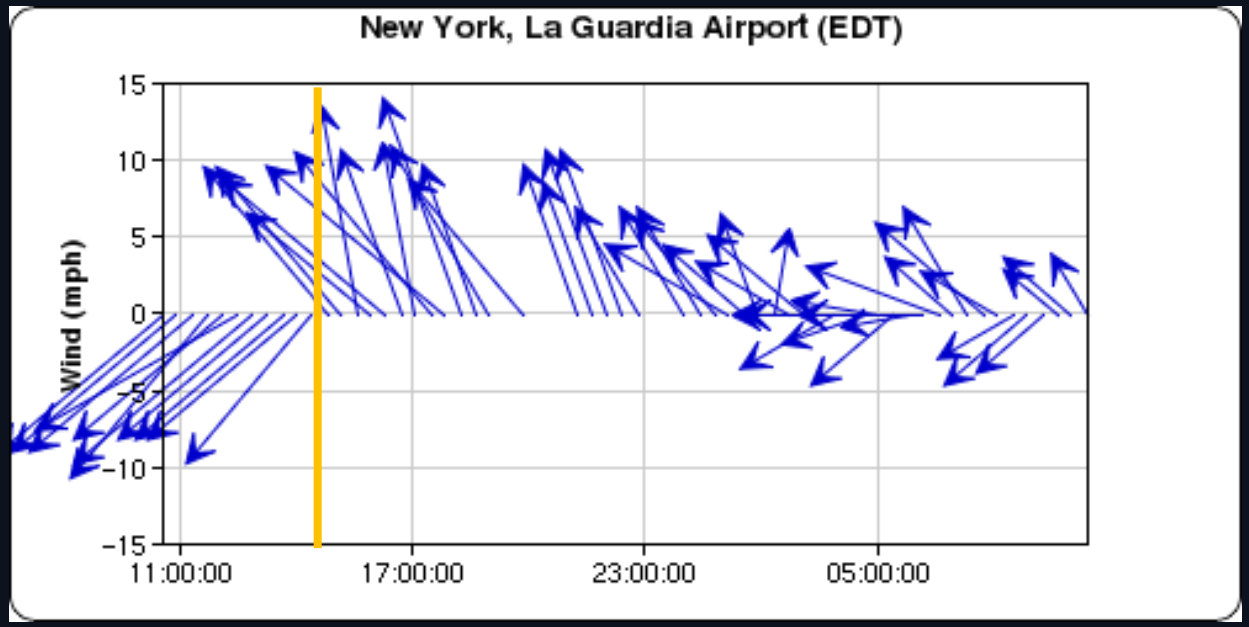
METAR KLGA 051900Z AUTO 13011KT 10SM FEW070 29/13 A3018



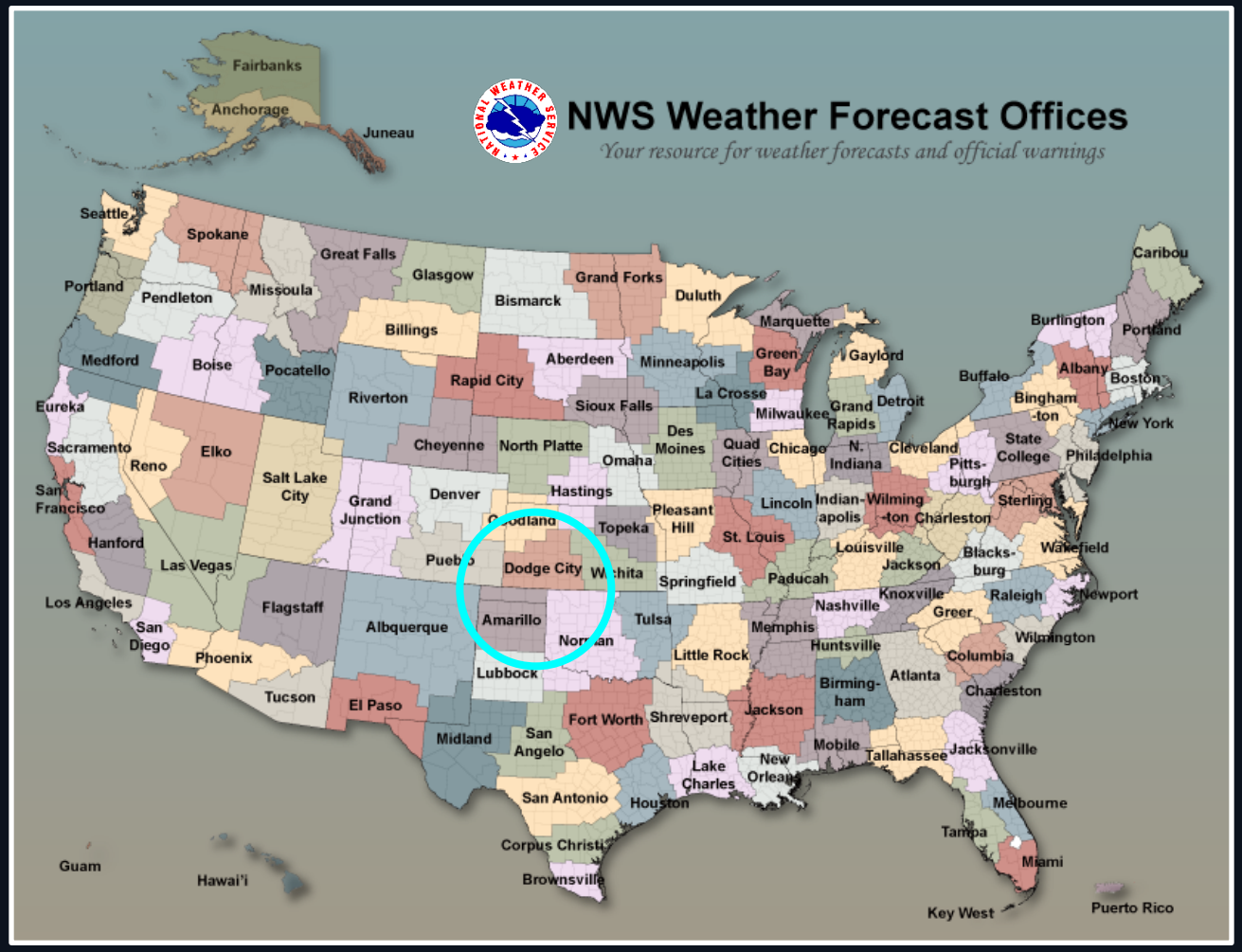
Aviation Forecasting – NWS Feedback

"The real time GOES 16 imagery is now combined with ground based radar systems to improve tracking, timeliness, and confidence of meteorological features that can result in wind shifts."

- Jeff Tongue
Science Operations Officer, NWS WFO New York, NY

Aviation Forecasting Q&A Discussion

2. Wildfire Support: Dodge City, KS and Amarillo, TX NWS Forecast Offices

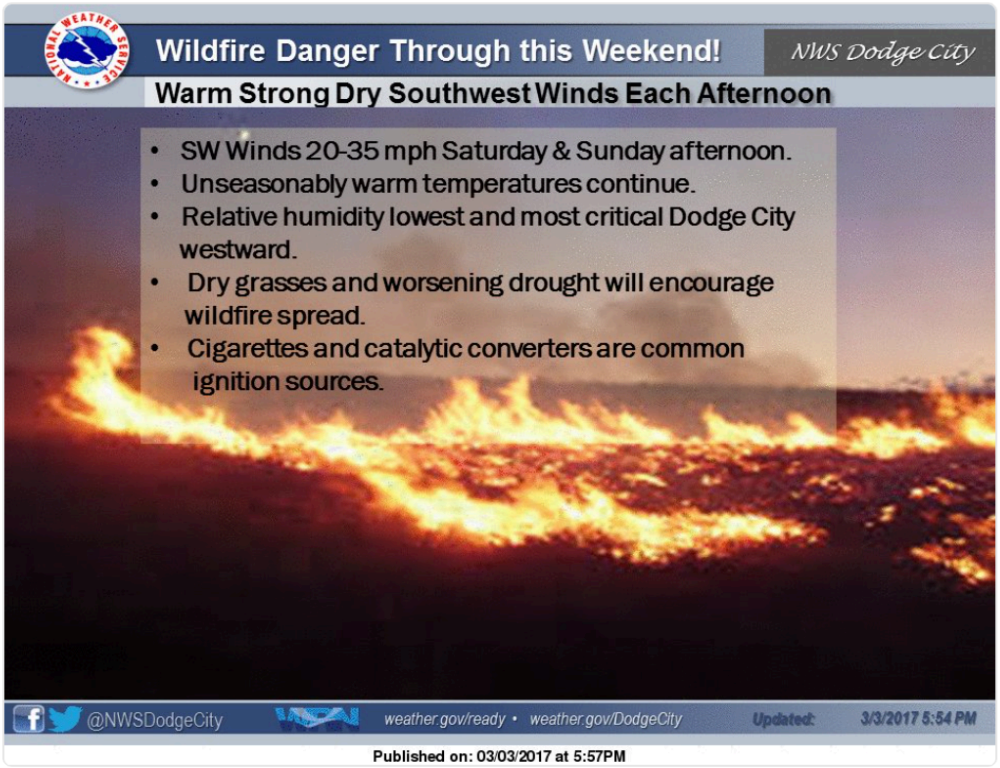


Wildfire Detection and Monitoring – 6 March 2017

Three days prior...

NWS Dodge City @NWSDodgeCity · Mar 3

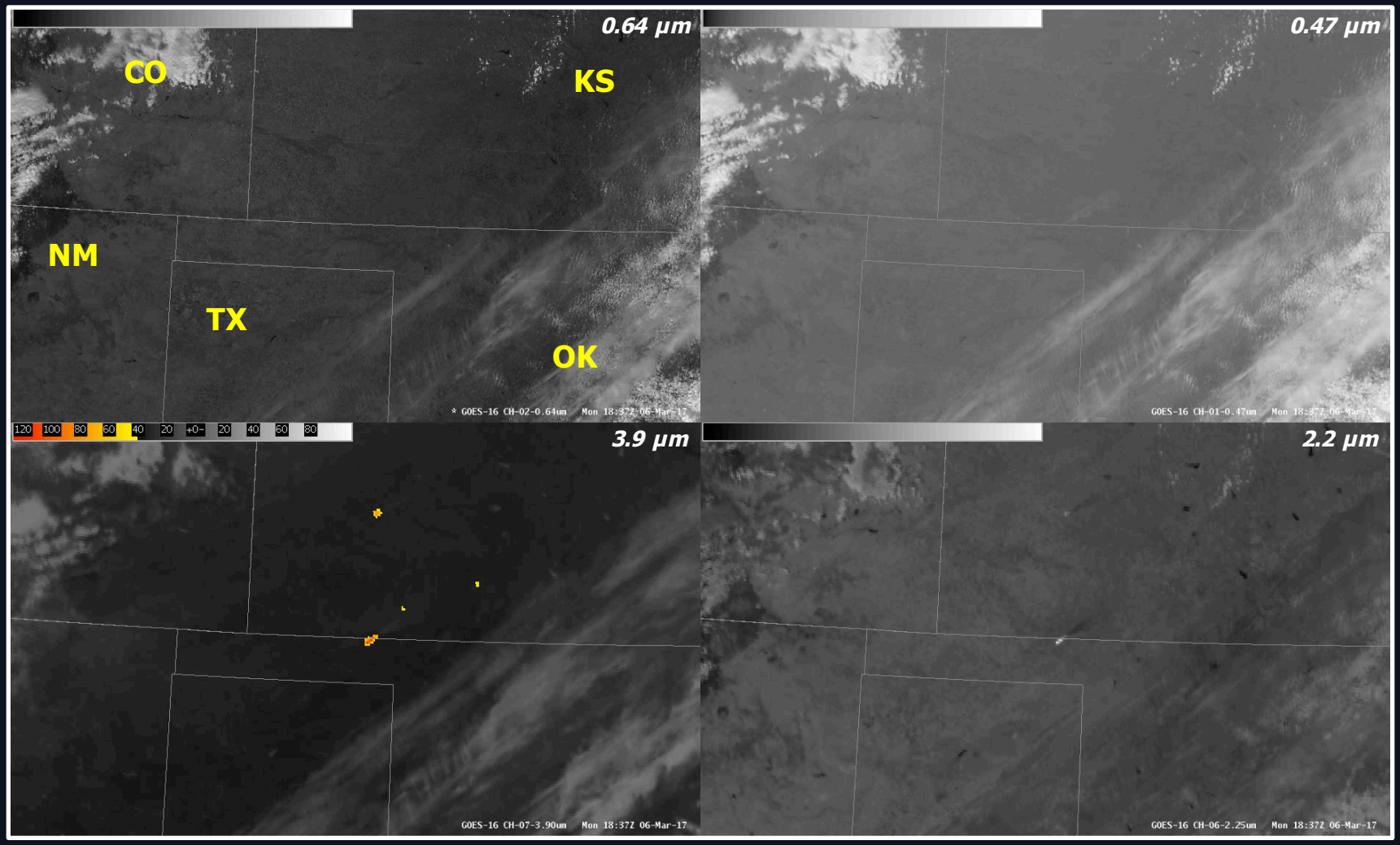
Wildfire danger continues across SW Kansas through this weekend. #kswx



8 2

This heightened awareness allowed for resources to be pre-staged to respond to the fires much more quickly, resulting in less damage and loss of life than otherwise could have happened.

Wildfire Detection and Monitoring – 6 March 2017 1837-2252 UTC

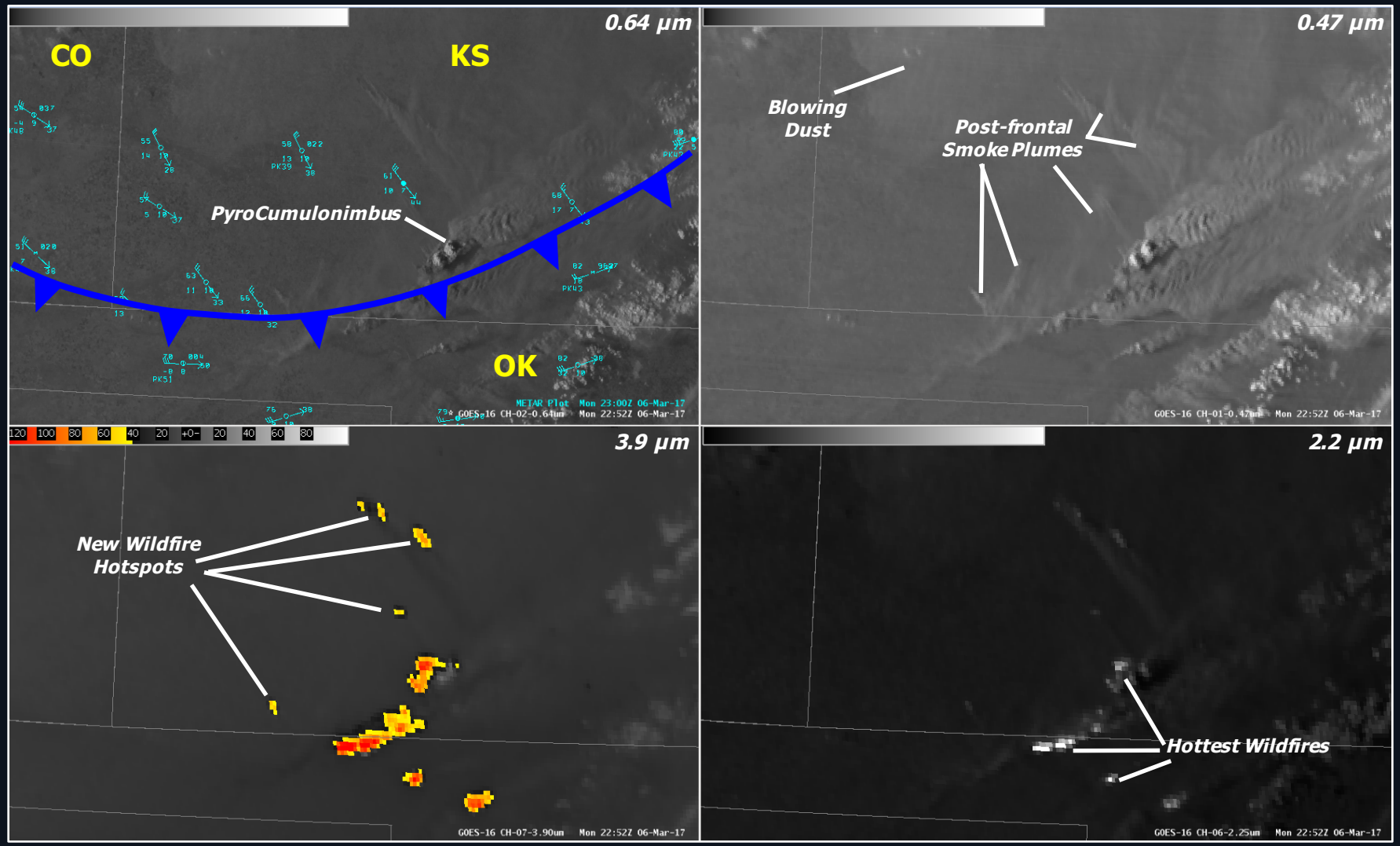


NWS Dodge City @NWSDodgeCity · Mar 6

There are wildfires everywhere! Please do not throw your cigarette butts out the window!!!

1 13 12

Wildfire Detection and Monitoring – 6 March 2017 2252 UTC

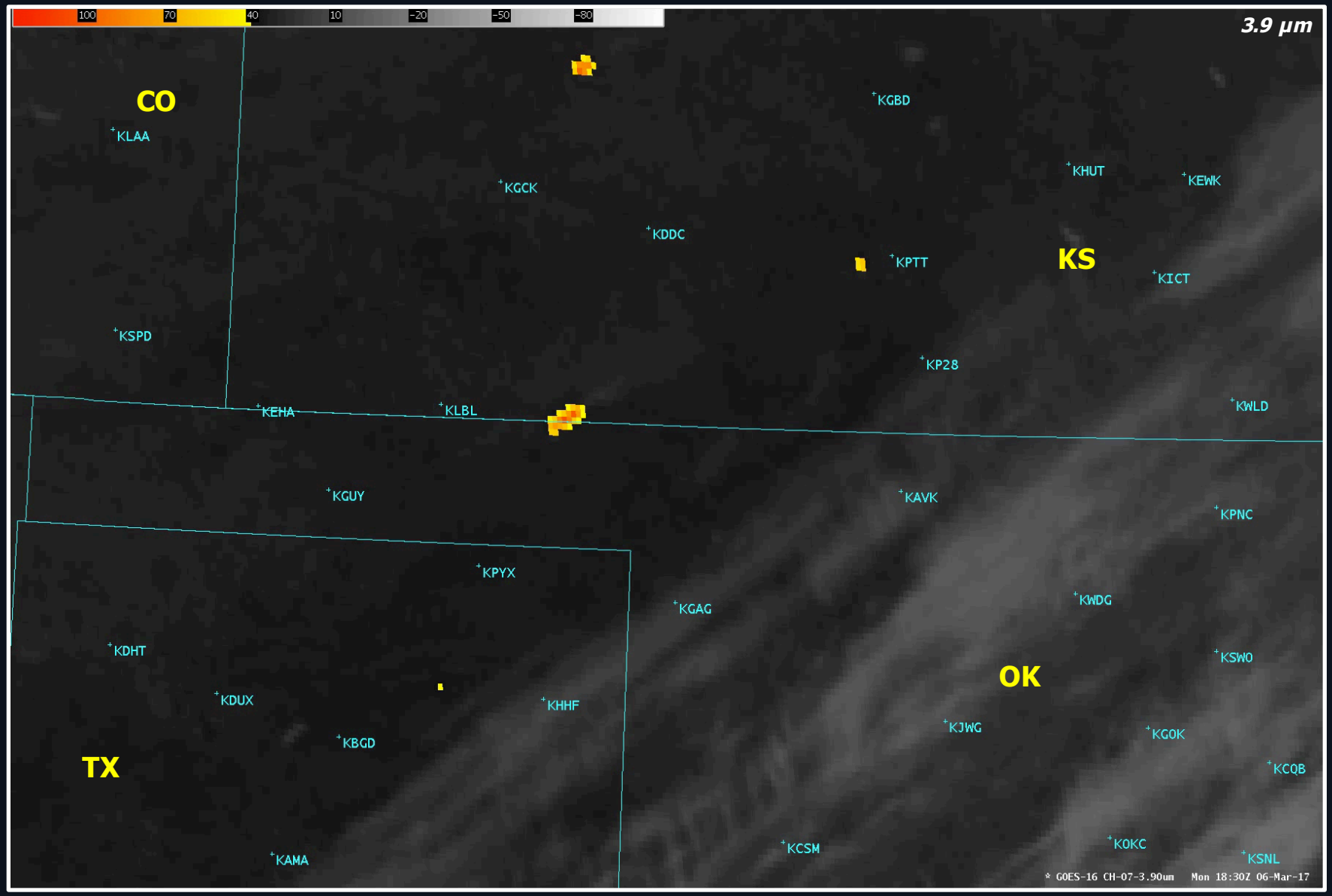


Wildfire Detection and Monitoring – NWS Feedback

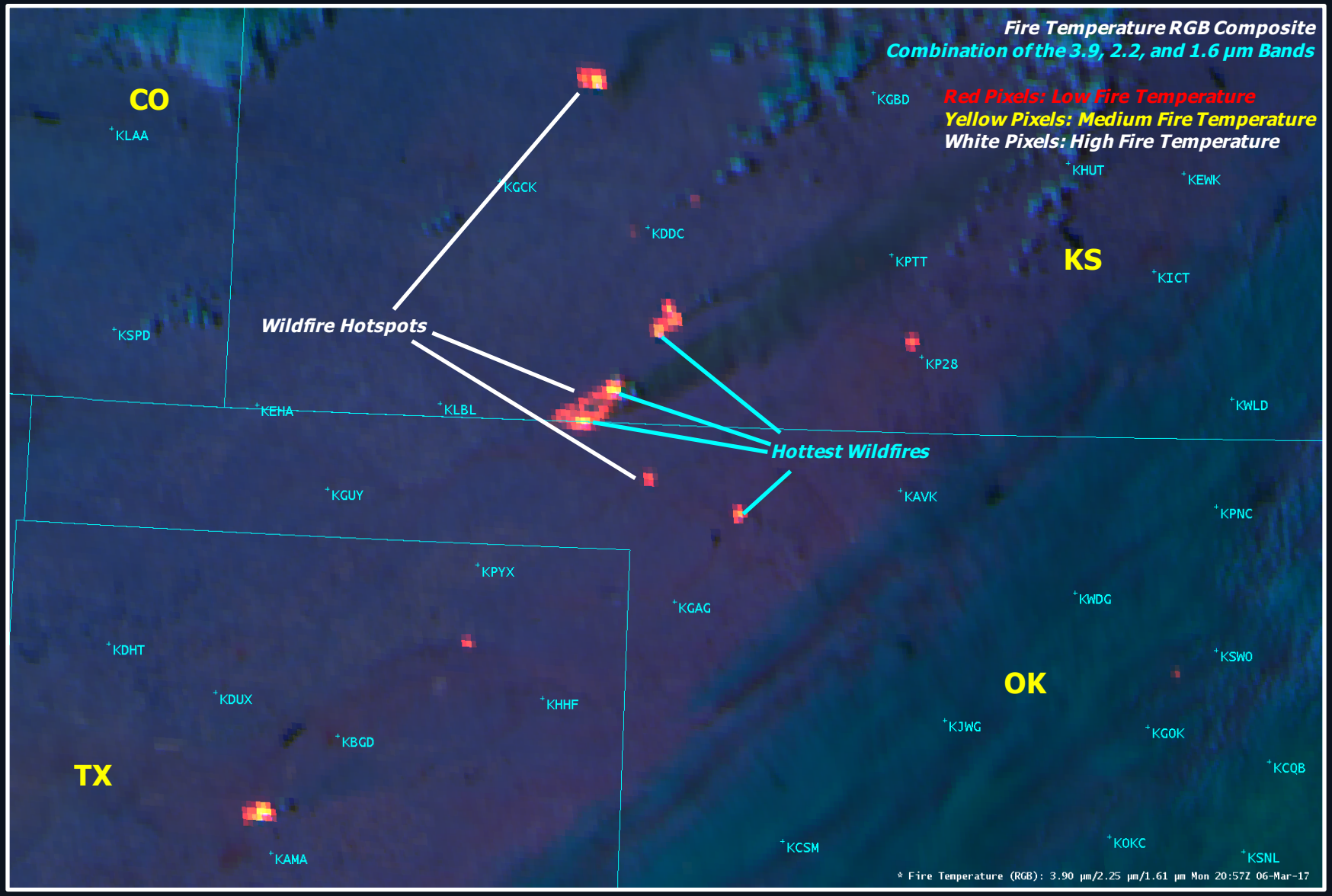
"GOES-16 imagery is already incredible due to higher spatial and temporal resolution, but having the mesoscale sector over our region allowed various WFOs to alert fire officials of all three major wildfires at least 10 minutes before they were notified via 911."

- Dr. Stephen Bieda
Science Operations Officer, NWS WFO Amarillo, TX

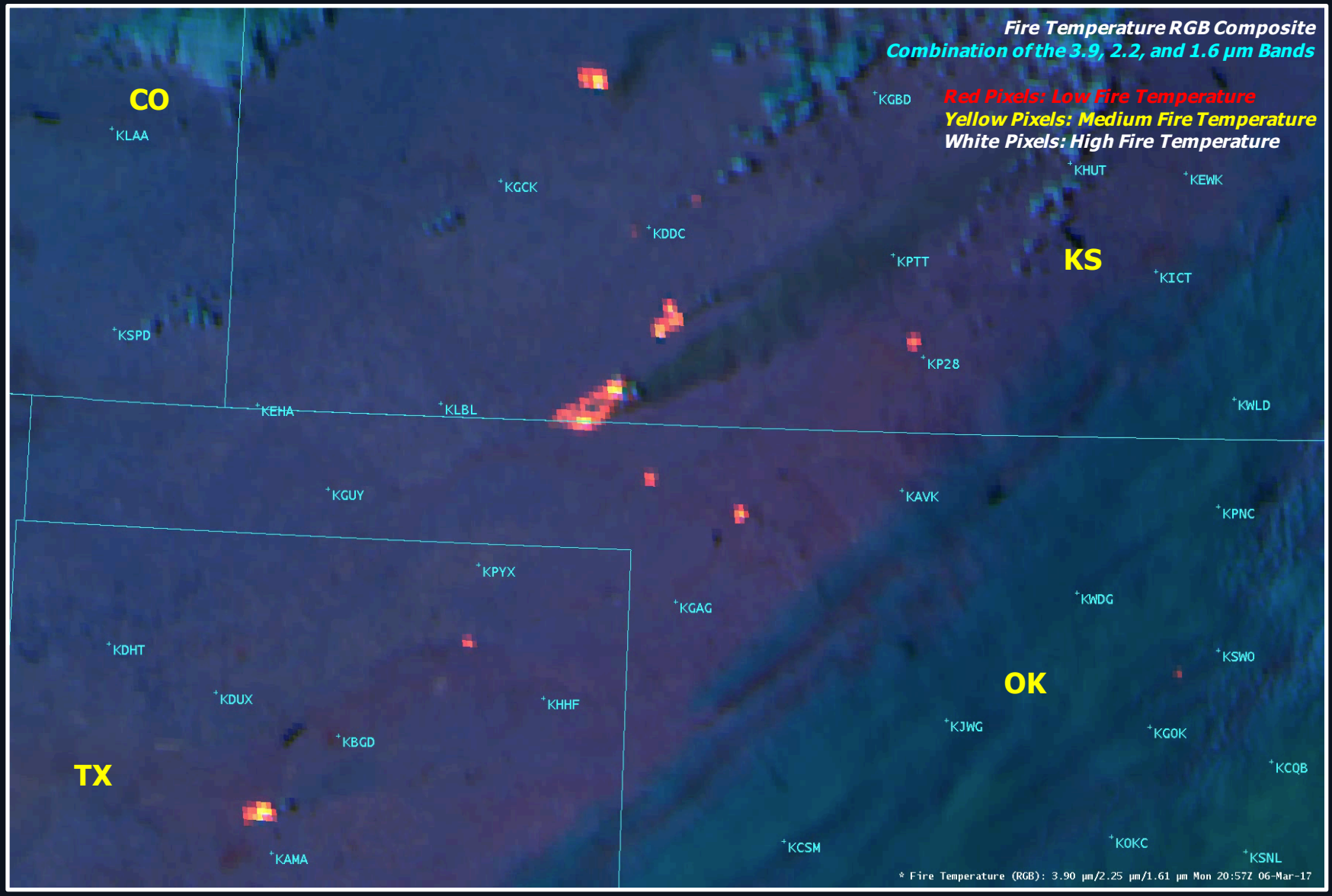
Wildfire Detection and Monitoring – 6 March 2017 1830-2358 UTC



Wildfire Detection and Monitoring – 6 March 2017 2057 UTC



Wildfire Detection and Monitoring – 6 March 2017 2057-2358 UTC



Wildfire Detection and Monitoring – NWS Feedback

"This was an excellent hands-on demonstration of the capability GOES-16 provides to detect wildfires in real time, and how to quickly apply these data for IDSS. We were calling local officials and, in some cases, it was the first notification they had of these fires – even before they got 911 calls. Given how overwhelmed these rural counties were, they were very thankful for the heads-up. They were able to begin planning evacuations before the fires turned due to the wind shift. I'm not sure how aware they would have been that day without us calling them directly."

- Aaron Johnson
Science Operations Officer, NWS WFO Dodge City, KS

Wildfire Detection and Monitoring – 6 March 2017

GOES-16 Wildfire YouTube

All Videos News Maps Shopping More Settings Tools

About 2,450,000 results (0.46 seconds)

Using GOES-16 to Enhance Wildfire IDSS - YouTube

https://www.youtube.com/watch?v=P1oVl9nL9LQ

Apr 12, 2017 - Upload

On March 6-7, 2017,

Kansas and Oklahom

Using GOES-16 to Enhance Wildfire IDSS

NWSTrainingCenter

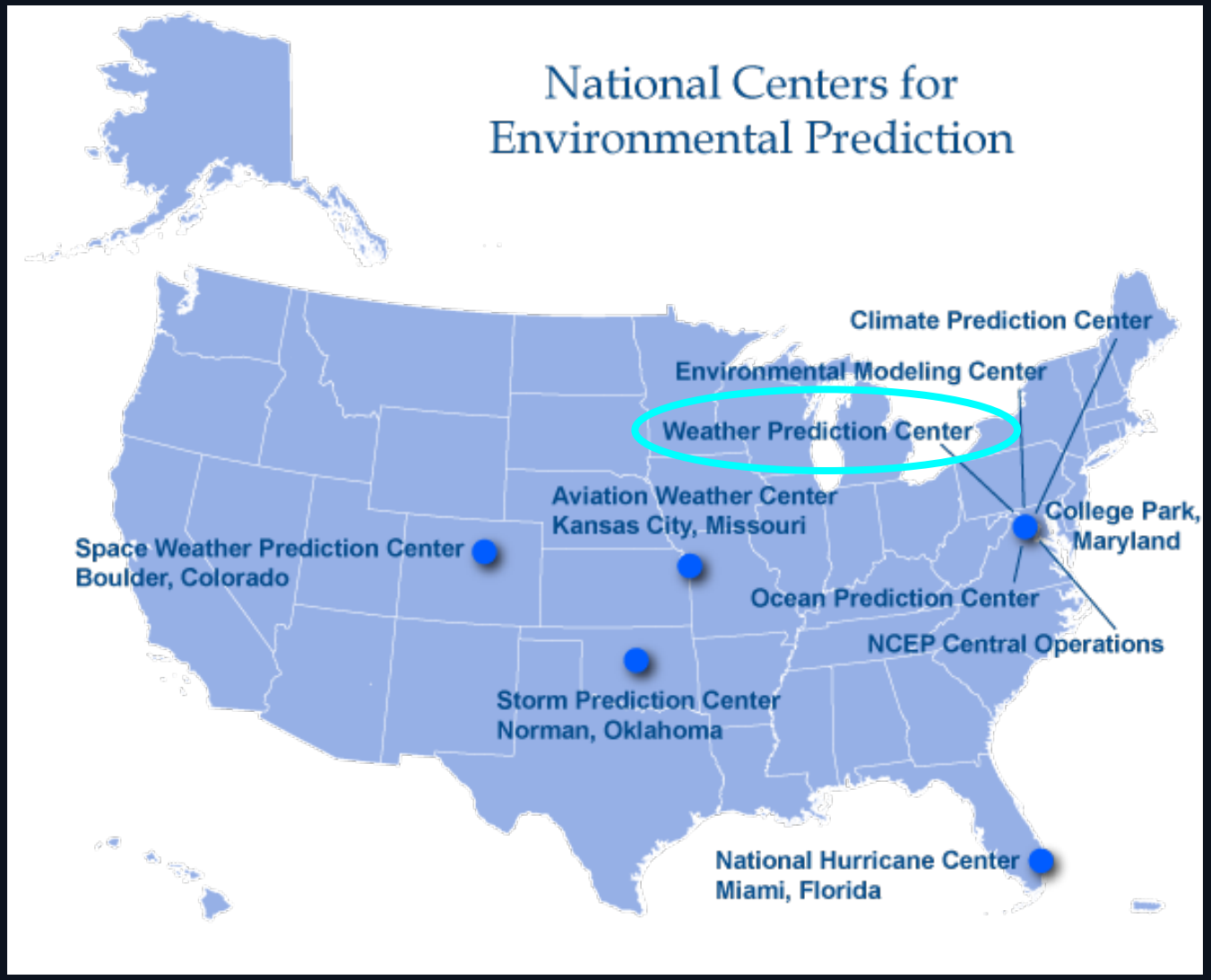
Subscribe 173

1,289 views

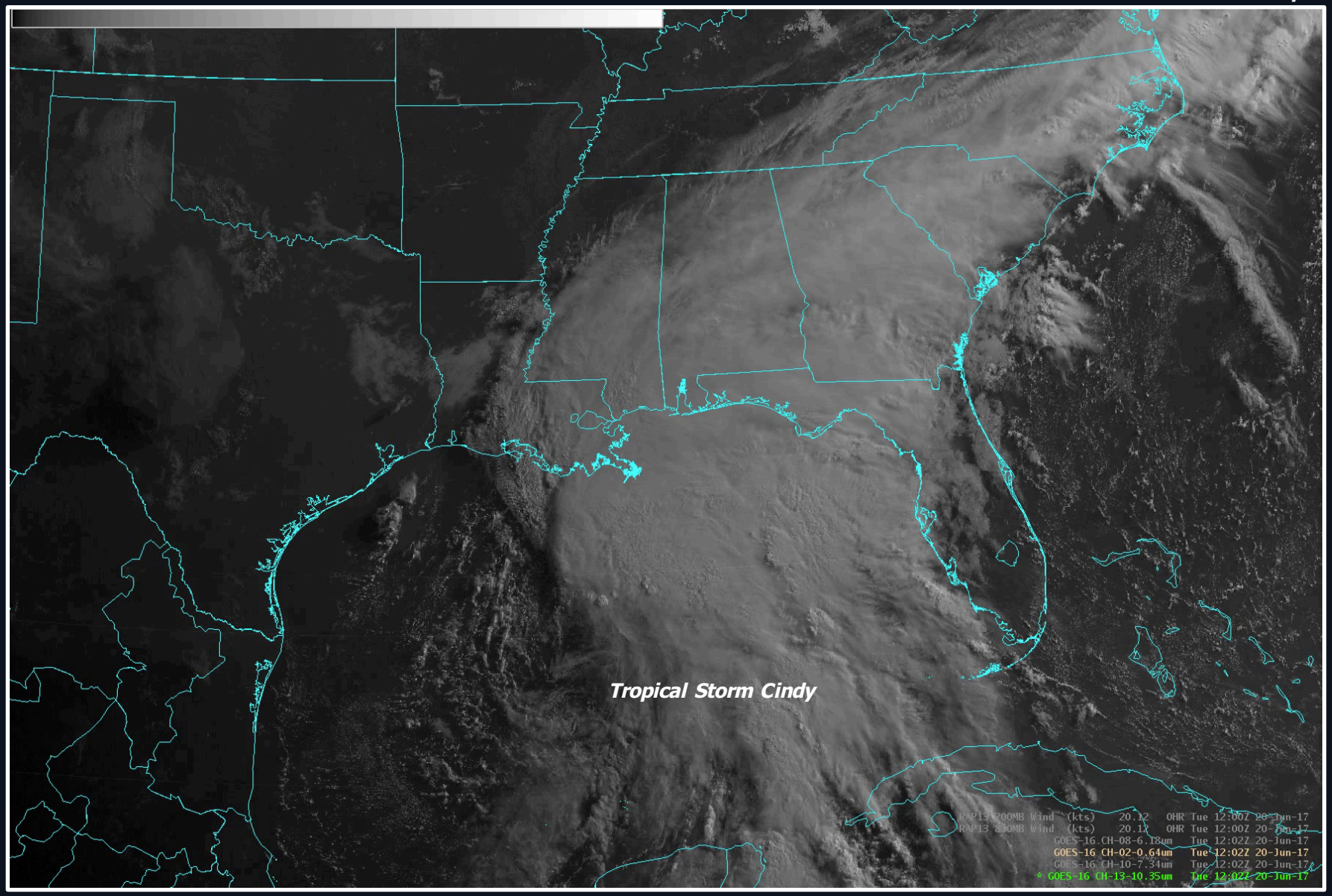
Add to Share More 8 0

Wildfire Detection and Monitoring Q&A Discussion

3. Heavy Precipitation: NCEP Weather Prediction Center

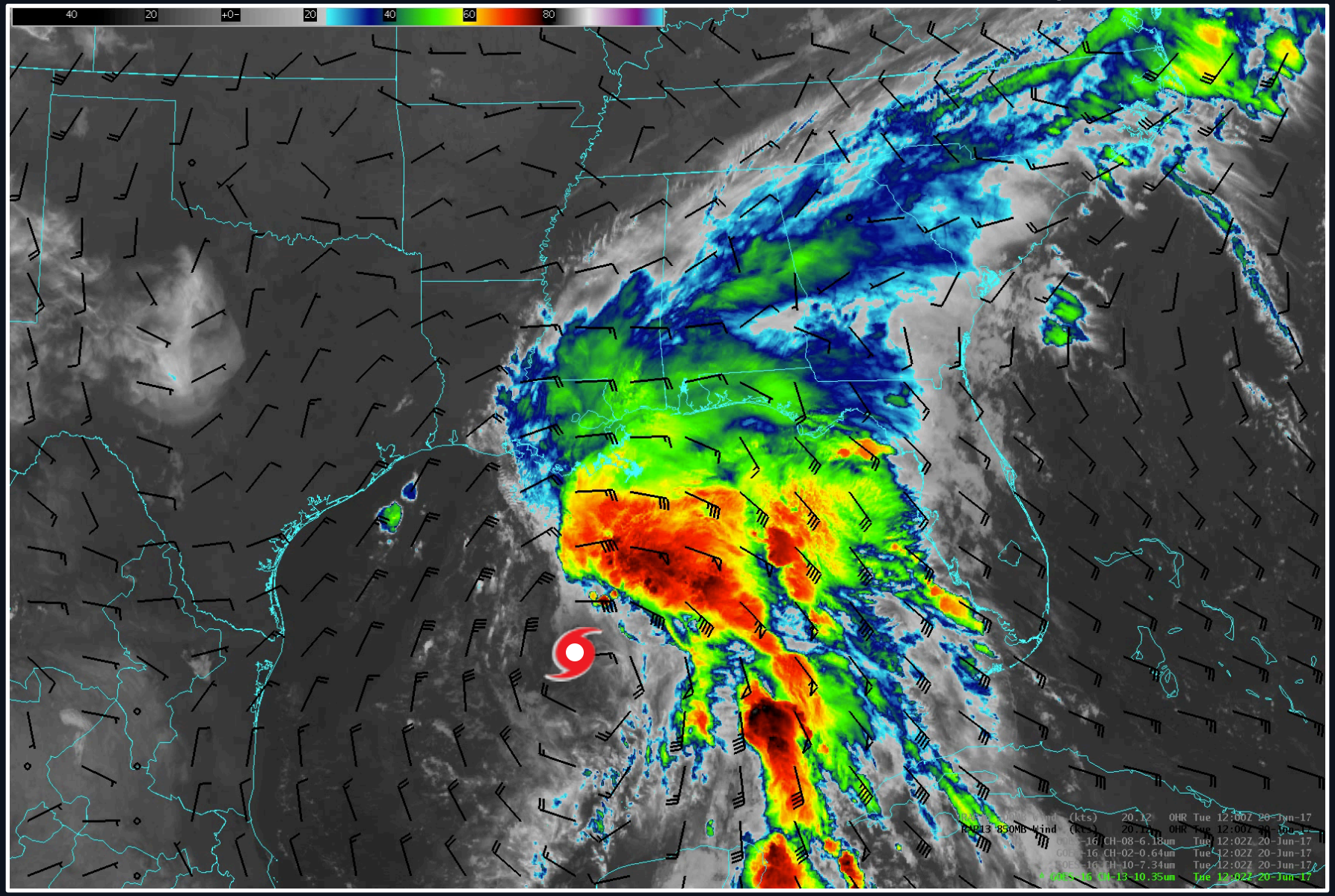


Heavy Precipitation – 20 June 2017 1202-1912 UTC

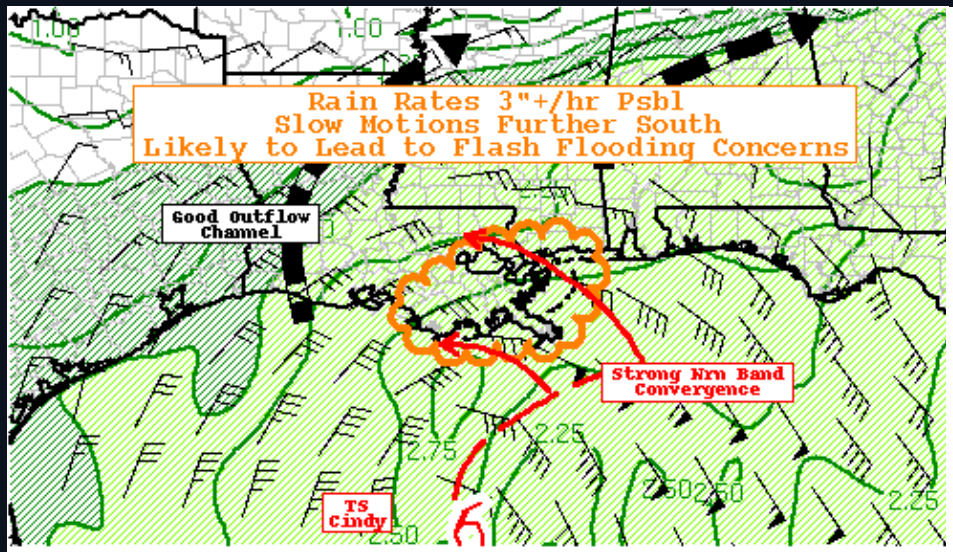


Heavy Precipitation – 20 June 2017 1202-1912 UTC

10.3 µm and RAP 850-mb Winds



Heavy Precipitation – 20 June 2017



RAP32 PRECIP WATER 170620/1800F001
RAP32 850 WINDS 170620/1800F001
WPC MPD #0349

MESOSCALE PRECIPITATION DISCUSSION 0349
NWS WEATHER PREDICTION CENTER COLLEGE PARK MD
316 PM EDT TUE JUN 20 2017

AREAS AFFECTED...SOUTHEAST LA...COASTAL MS

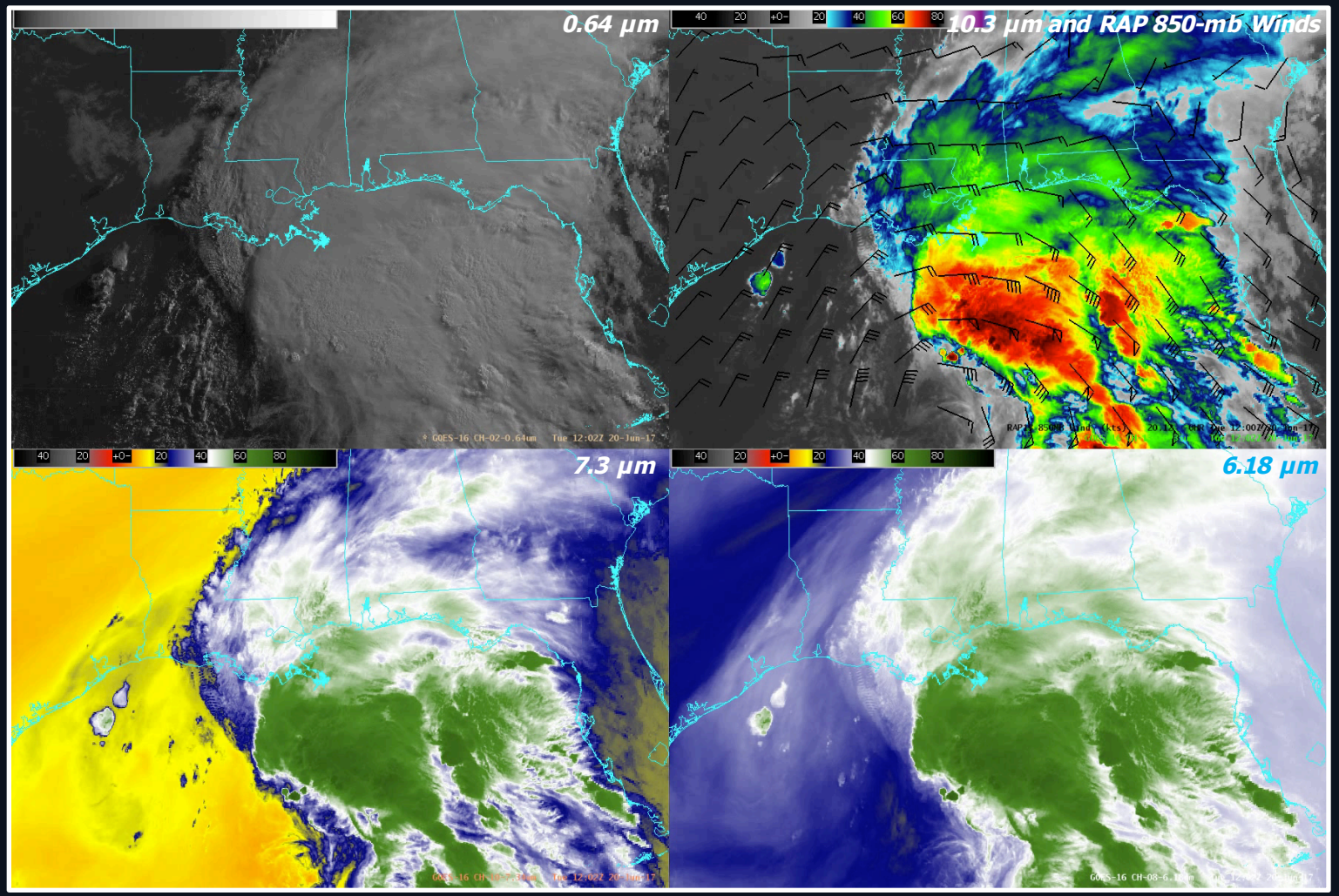
CONCERNING...HEAVY RAINFALL...FLASH FLOODING LIKELY

VALID 201915Z - 210000Z

SUMMARY...NORTHERN CONVERGENCE BAND TO TS CINDY.

DISCUSSION...**RECENT GOES-16 EXPERIMENTAL AND RADAR TRENDS DENOTE A SLIGHT INCREASE IN ELONGATION TOWARD THE NORTHEAST OF TS CINDY**...WV ALSO DENOTES A SLIGHT NORTHEAST PUNCH OF 7H-5H DRY AIR AS FAR EAST AS 88W. THIS ORIENTATION IS STRENGTHENING LOW LEVEL WIND FIELD CONVERGENCE WHILE SLIGHTLY INCREASING INSTABILITY ALOFT. IN RESPONSE CONVECTION HAS BEEN GROWING ALONG THE NORTHERLY CONVERGENCE BAND WITH EIR TOPS ECLIPSING -80C. WV LOOP ALSO SHOWS SOLID 130-150 DEGREES OF OUTFLOW JET TO THE NORTH WITH MODEST ANTICYCLONIC SUPER-GEOSTROPHIC EFFECTS FURTHER AIDING DIVERGENCE ALOFT FOR CONVECTIVE GROWTH. THE CONVERGENCE BAND SHOULD ROTATE NORTHWARD THEN WESTWARD WITH THE SW FLANK PIVOTED NEAR THE NORTHERN PORTION OF THE INNER CENTER SOUTH OF TERREBOUNE BAY. AS THE BAND ROTATES THROUGH SE LA...OVER THE NEXT THREE TO FOUR HOURS...STRONG UPSTREAM CONVERGENCE PERHAPS ENHANCED ALONG COAST AS FRICTIONAL EFFECTS TO ALLOW FOR REGENERATION/BACKBUILDING THROUGH THE EVENING HOURS ACROSS SE LA. GIVEN TOTAL PWS OVER 2.5" AND CONVERGENT WINDS IN EXCESS OF 40KTS...FLUX WILL BE HIGH WITH EXTREME RAINFALL EFFICIENCY WITH 3"/HR RAIN RATES LIKELY...WITH STRIPES OF 3-5" ARE PROBABLE OVER SE LA...WITH 6"+ LOCALIZED TOTALS NOT OUT OF THE QUESTION.

Heavy Precipitation – 20 June 2017 1202-1912 UTC

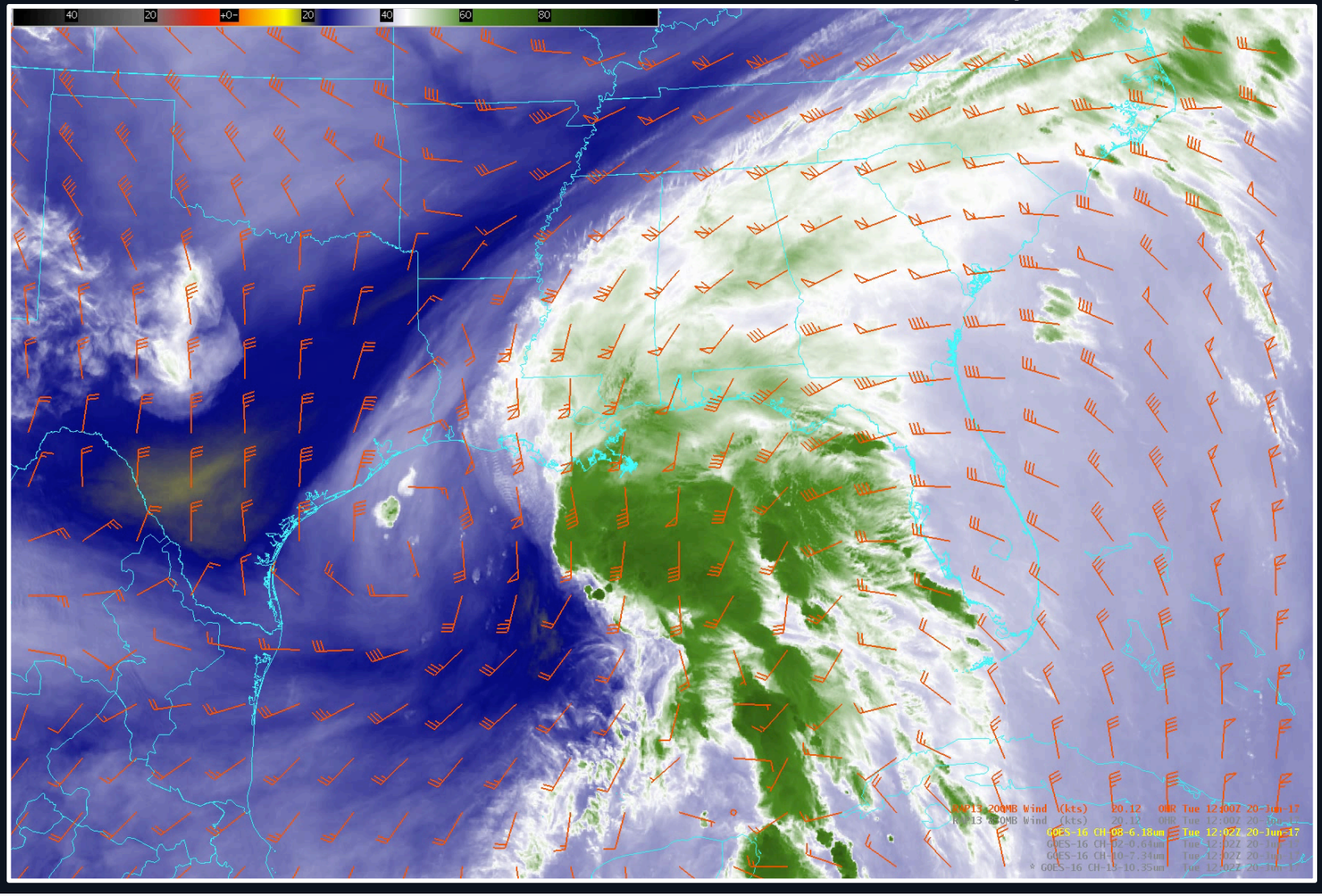


MESOSCALE PRECIPITATION DISCUSSION 0349
NWS WEATHER PREDICTION CENTER COLLEGE PARK MD
316 PM EDT TUE JUN 20 2017

DISCUSSION...RECENT GOES-16 EXPERIMENTAL AND RADAR TRENDS DENOTE A SLIGHT INCREASE IN ELONGATION TOWARD THE NORTHEAST OF TS CINDY...**WV ALSO DENOTES A SLIGHT NORTHEAST PUNCH OF 7H-5H DRY AIR AS FAR EAST AS 88W. IN RESPONSE CONVECTION HAS BEEN GROWING ALONG THE NORTHERLY CONVERGENCE BAND WITH EIR TOPS ECLIPSING -80C.**

Heavy Precipitation – 20 June 2017 1202-1912 UTC

6.18 µm and RAP 200-mb Winds



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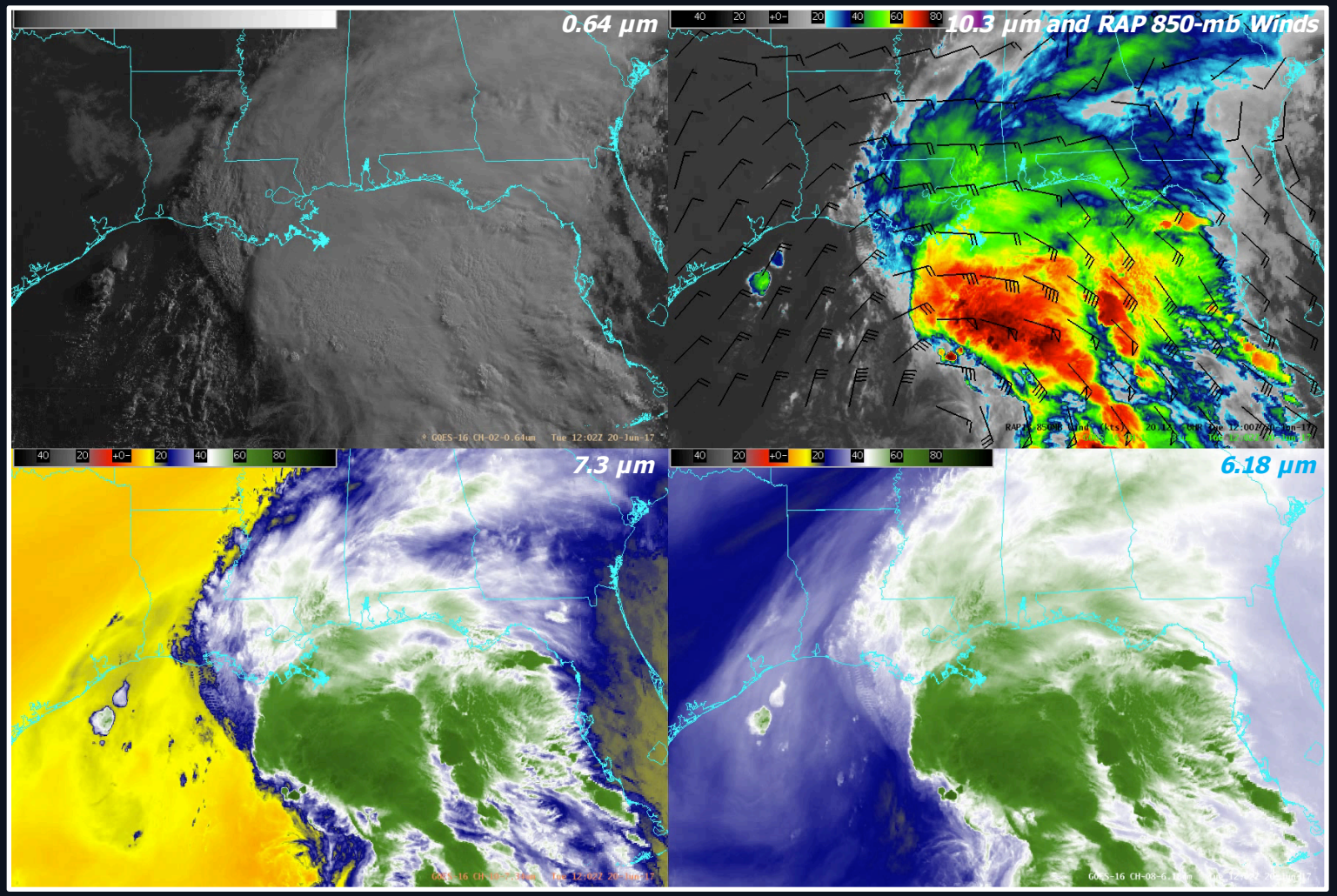
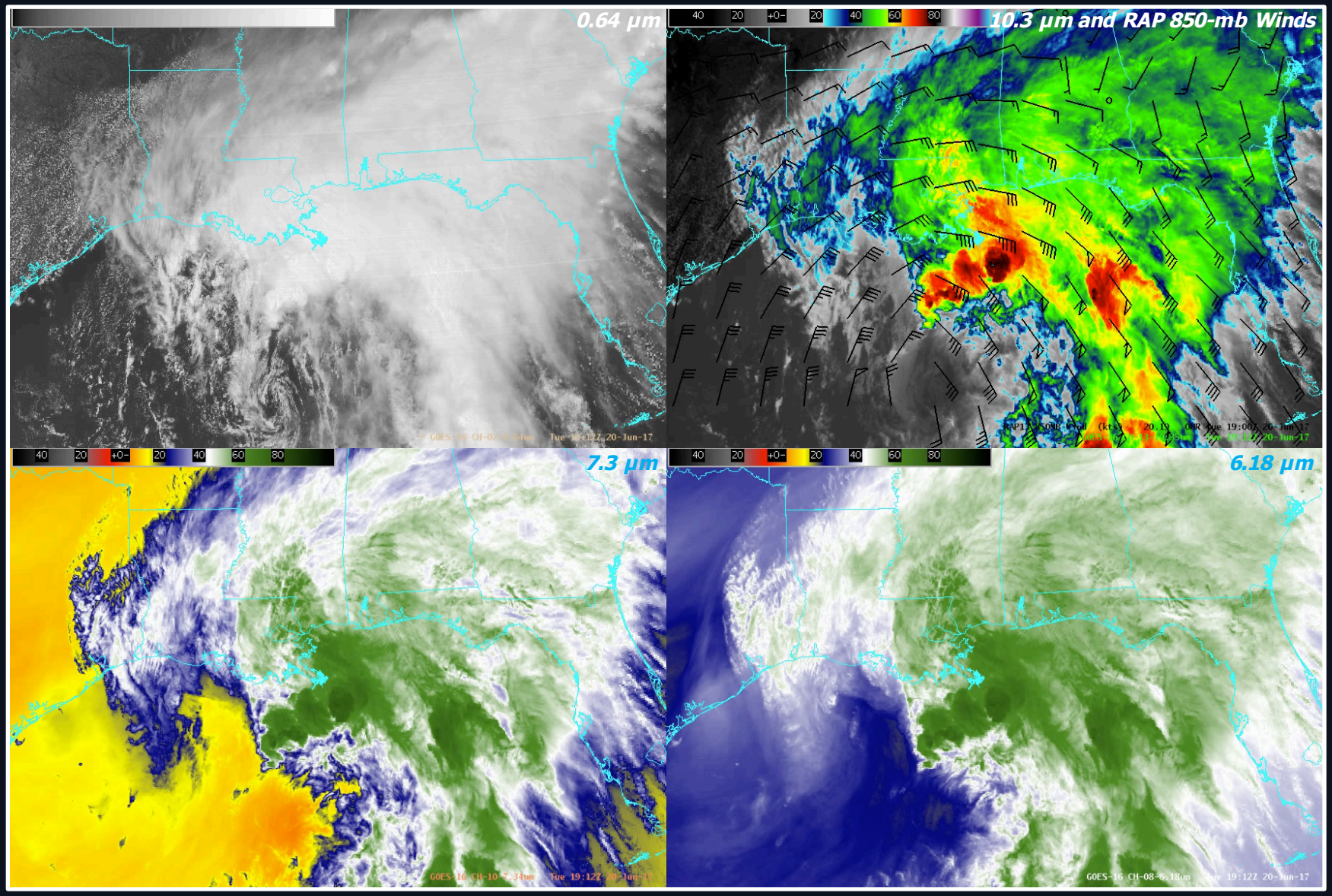
Heavy Precipitation – 20 June 2017 1202-1912 UTC



THE CONVERGENCE BAND SHOULD ROTATE NORTHWARD THEN WESTWARD WITH THE SW FLANK PIVOTED NEAR THE NORTHERN PORTION OF THE INNER CENTER SOUTH OF TERREBOUNE BAY. AS THE BAND ROTATES THROUGH SE LA...OVER THE NEXT THREE TO FOUR HOURS...STRONG UPSTREAM CONVERGENCE PERHAPS ENHANCED ALONG COAST AS FRICTIONAL EFFECTS TO ALLOW FOR REGENERATION/BACKBUILDING THROUGH THE EVENING HOURS ACROSS SE LA. GIVEN TOTAL PWS OVER 2.5" AND CONVERGENT WINDS IN EXCESS OF 40KTS...FLUX WILL BE HIGH WITH **EXTREME RAINFALL EFFICIENCY WITH 3"/HR RAIN RATES LIKELY...WITH STRIPES OF 3-5" ARE PROBABLE OVER SE LA...WITH 6"+ LOCALIZED TOTALS NOT OUT OF THE QUESTION.**

Heavy Precipitation – 20 June 2017 1912-2157 UTC



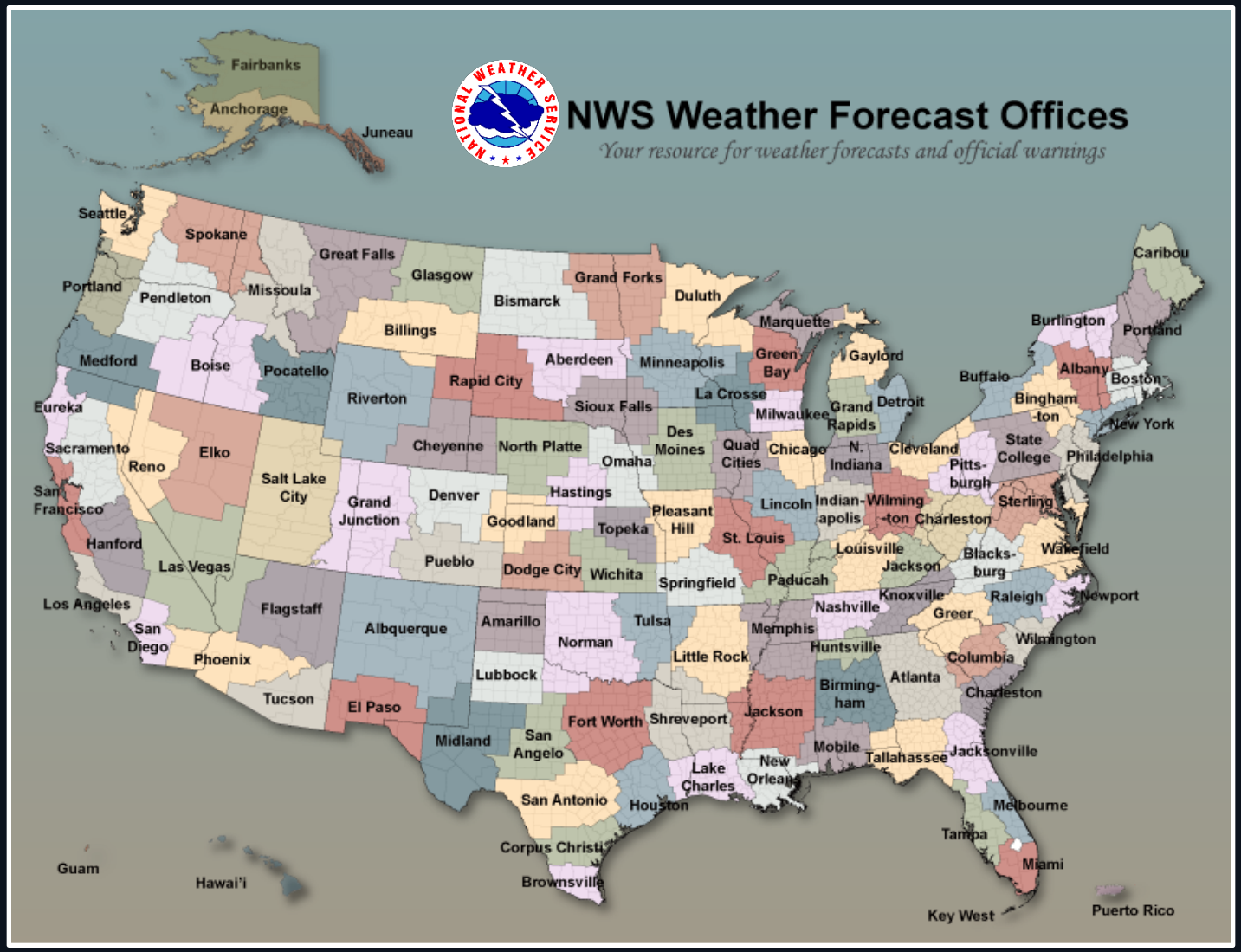
Heavy Precipitation – NWS Feedback

"I found the GOES-16 data to be critical in quickly assessing the convective organization of Cindy throughout the event, including convective banding trends, cloud texture changes, and cloud top cooling/warming patterns. This made it very helpful for nowcasting during the event. However, it was also instrumental in depicting features that promoted a hostile environment such as low and mid level dry air intrusions that, in the case of Cindy, disrupted the tropical cyclone's inner core and resulted in a highly asymmetric and non-uniform rainfall distribution on a larger scale."

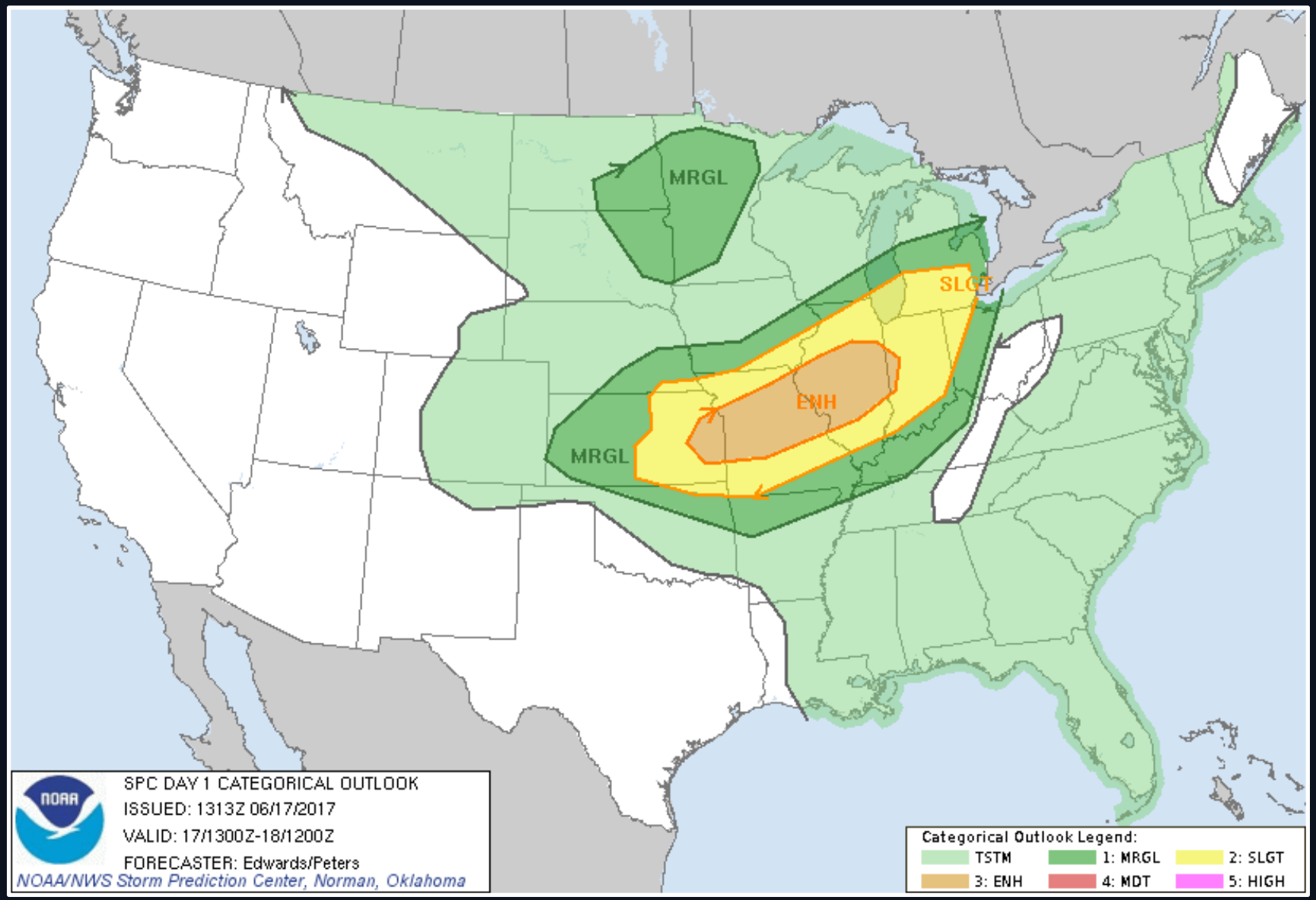
- Andrew Orrison
Met Watch Forecast Meteorologist, Weather Prediction Center

Heavy Precipitation Q&A Discussion

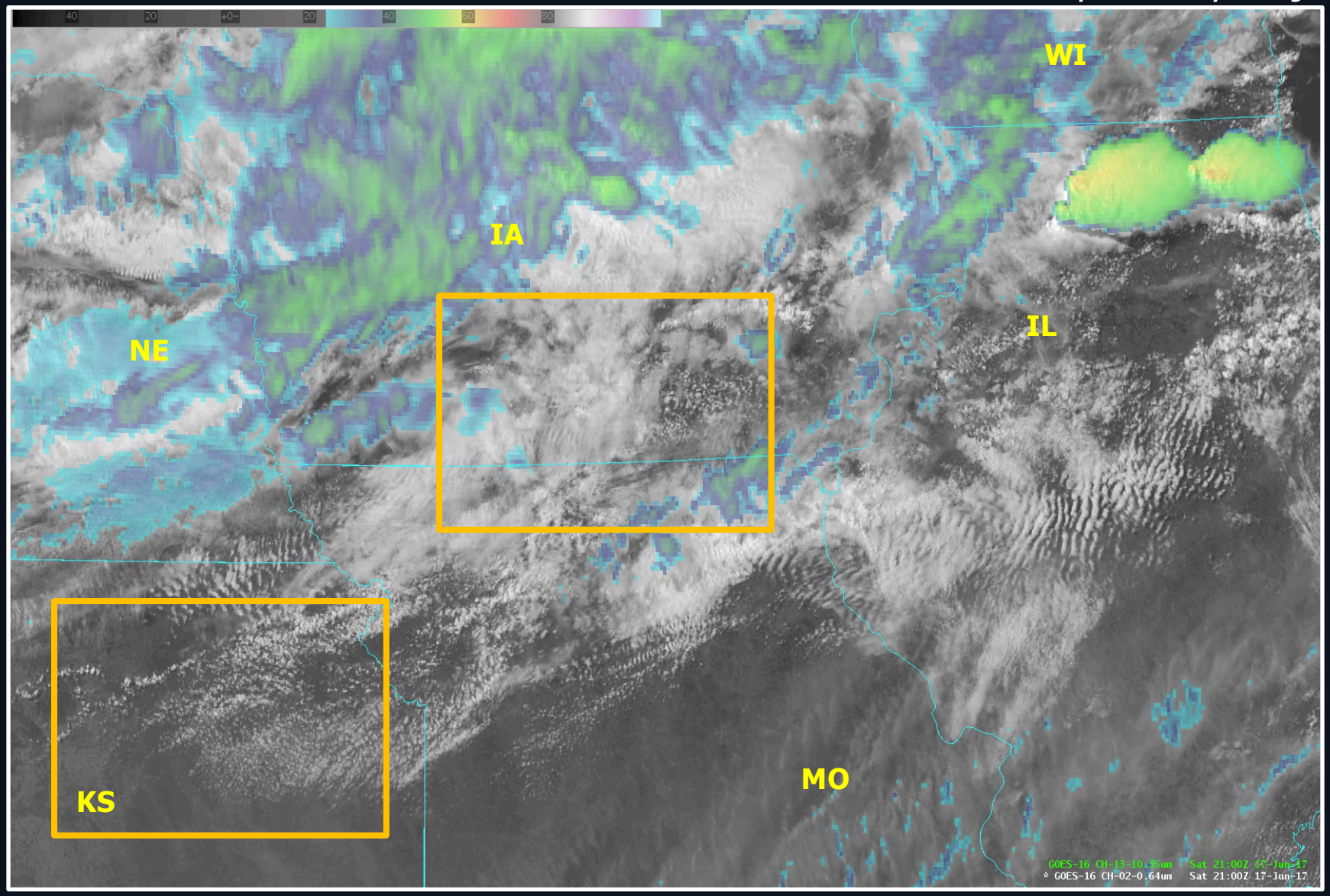
4. Convective Initiation and Evolution: Various NWS Forecast Offices



Monitoring Convection – 17-18 June 2017



Monitoring Convection – 17-18 June 2017 2100-0159 UTC

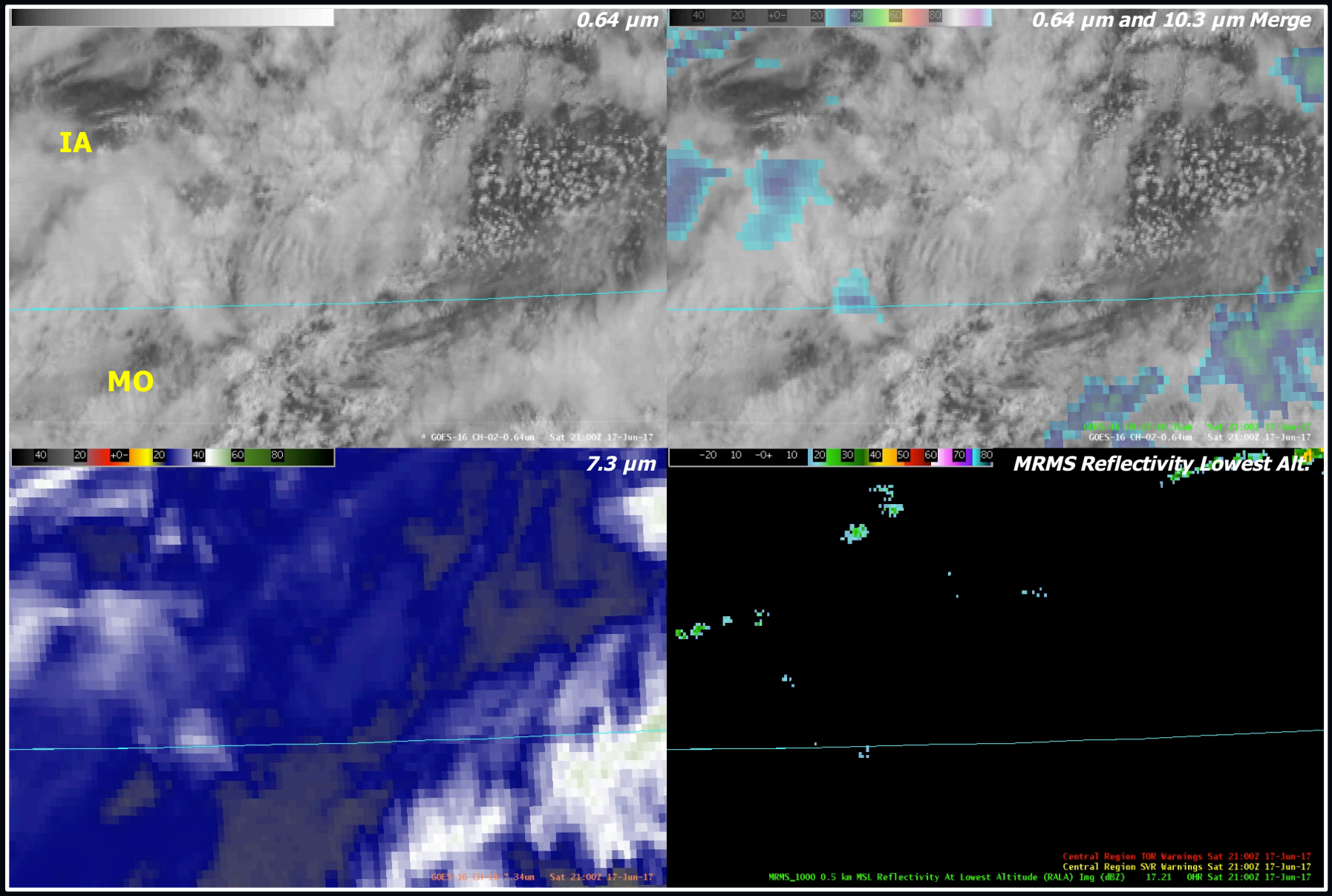


Monitoring Convection – NWS Feedback

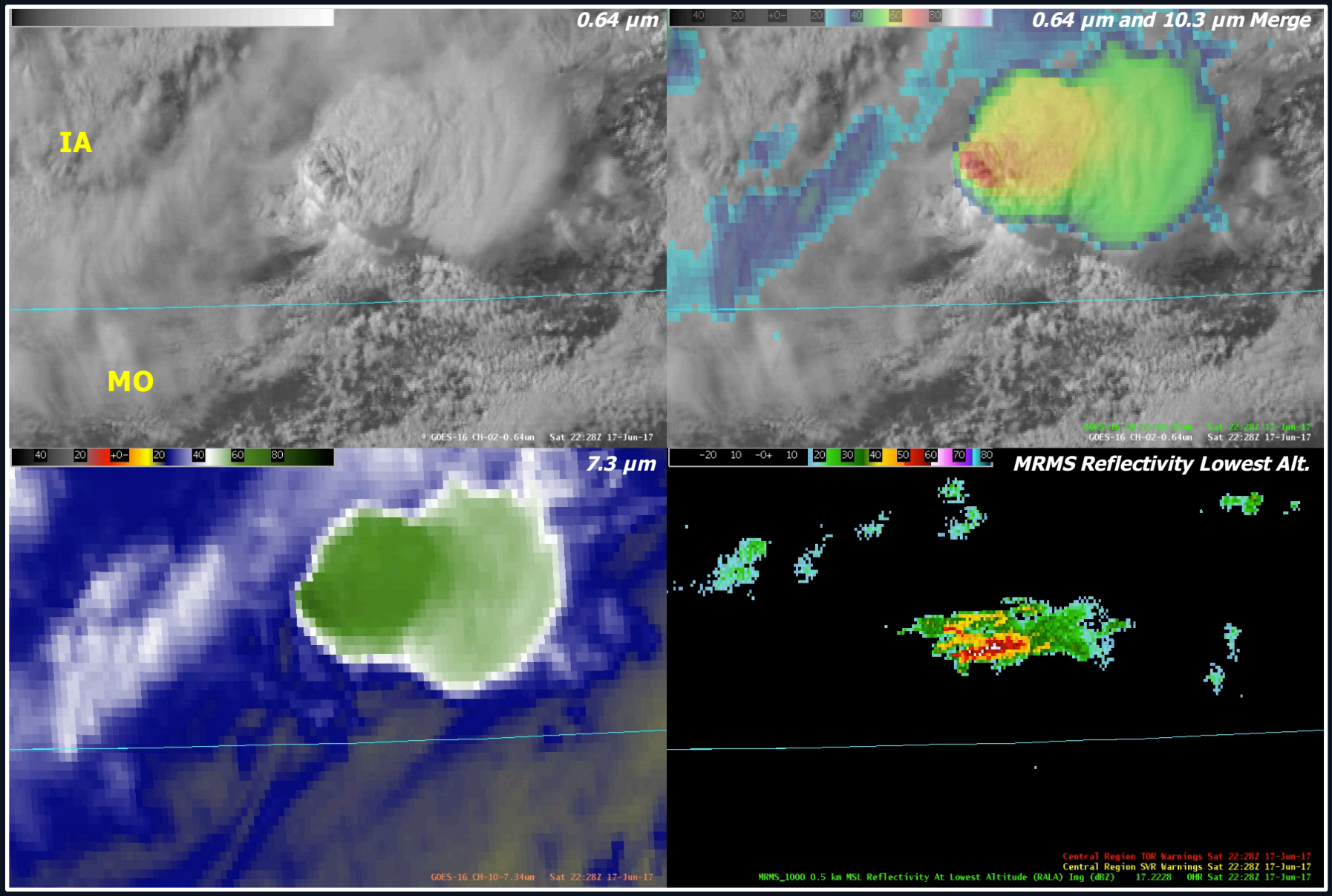
"GOES-16 1-minute imagery will revolutionize convective warning operations across the National Weather Service. Given its temporal superiority, forecasters are realizing that they are now able to anticipate radar trends including the initiation and evolution of severe convection from satellite data."

- Jim Sieveking
Science Operations Officer, NWS WFO St. Louis, MO

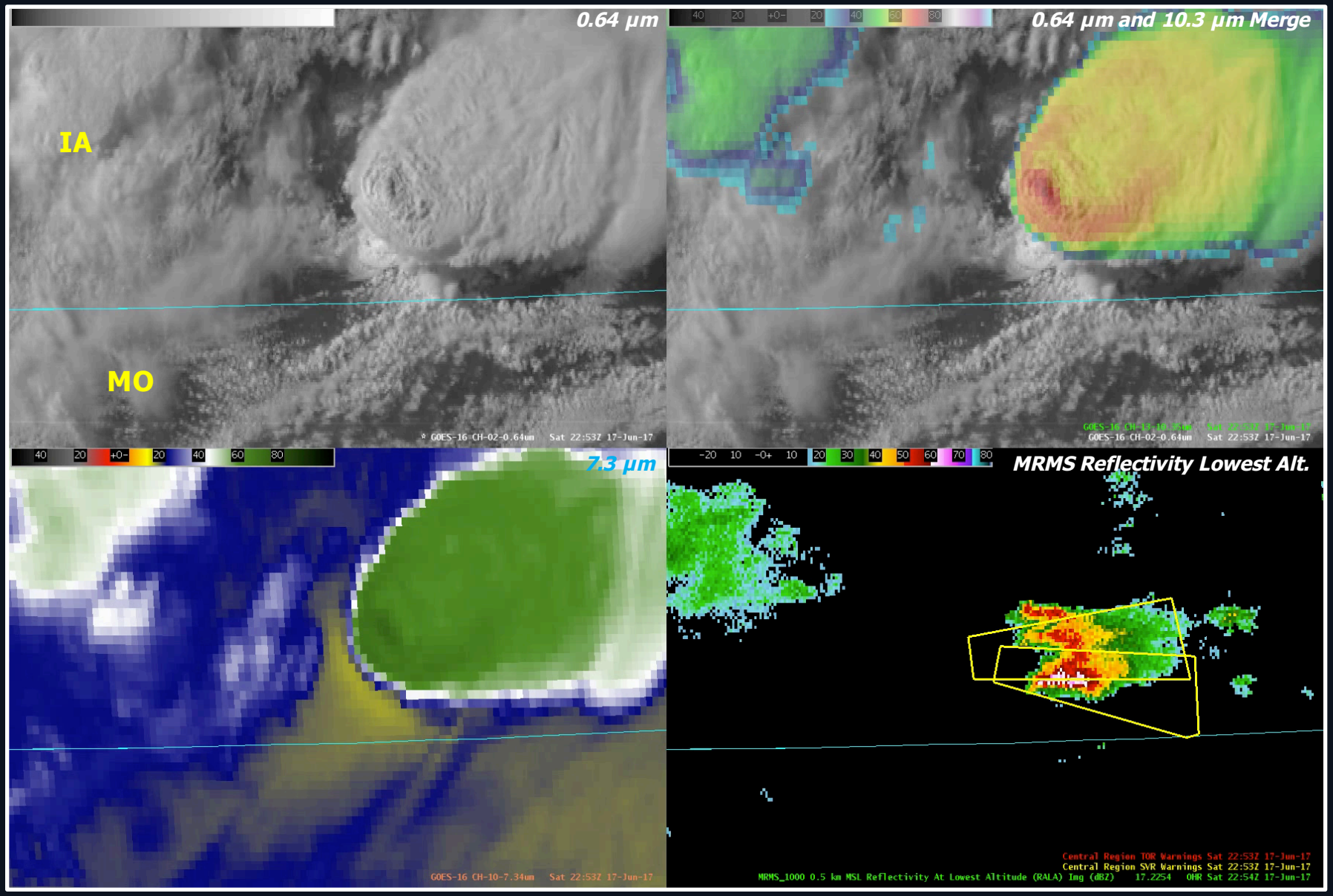
Monitoring Convection – 17 June 2017 2100-2227 UTC



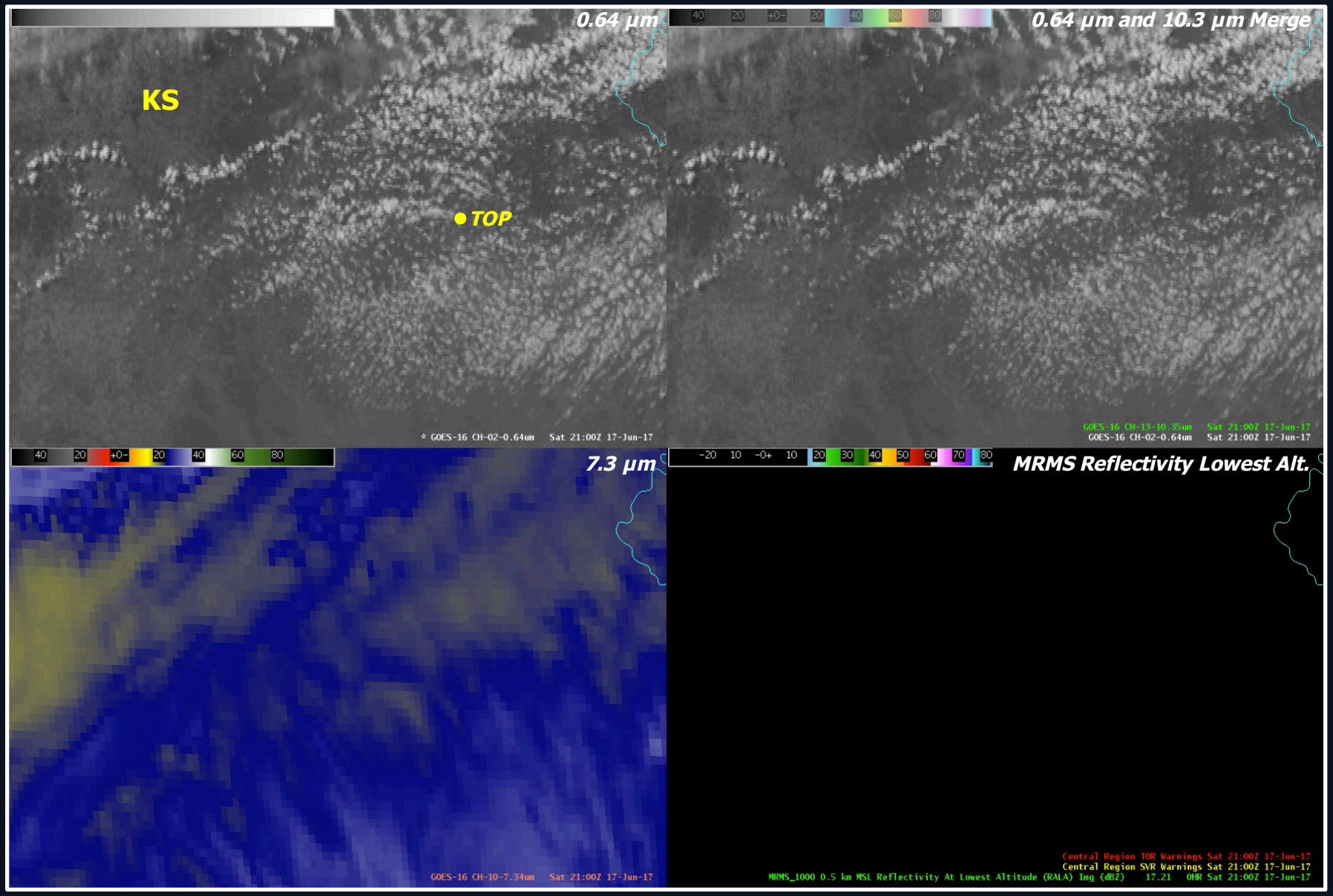
Monitoring Convection – 17 June 2017 2228-2253 UTC



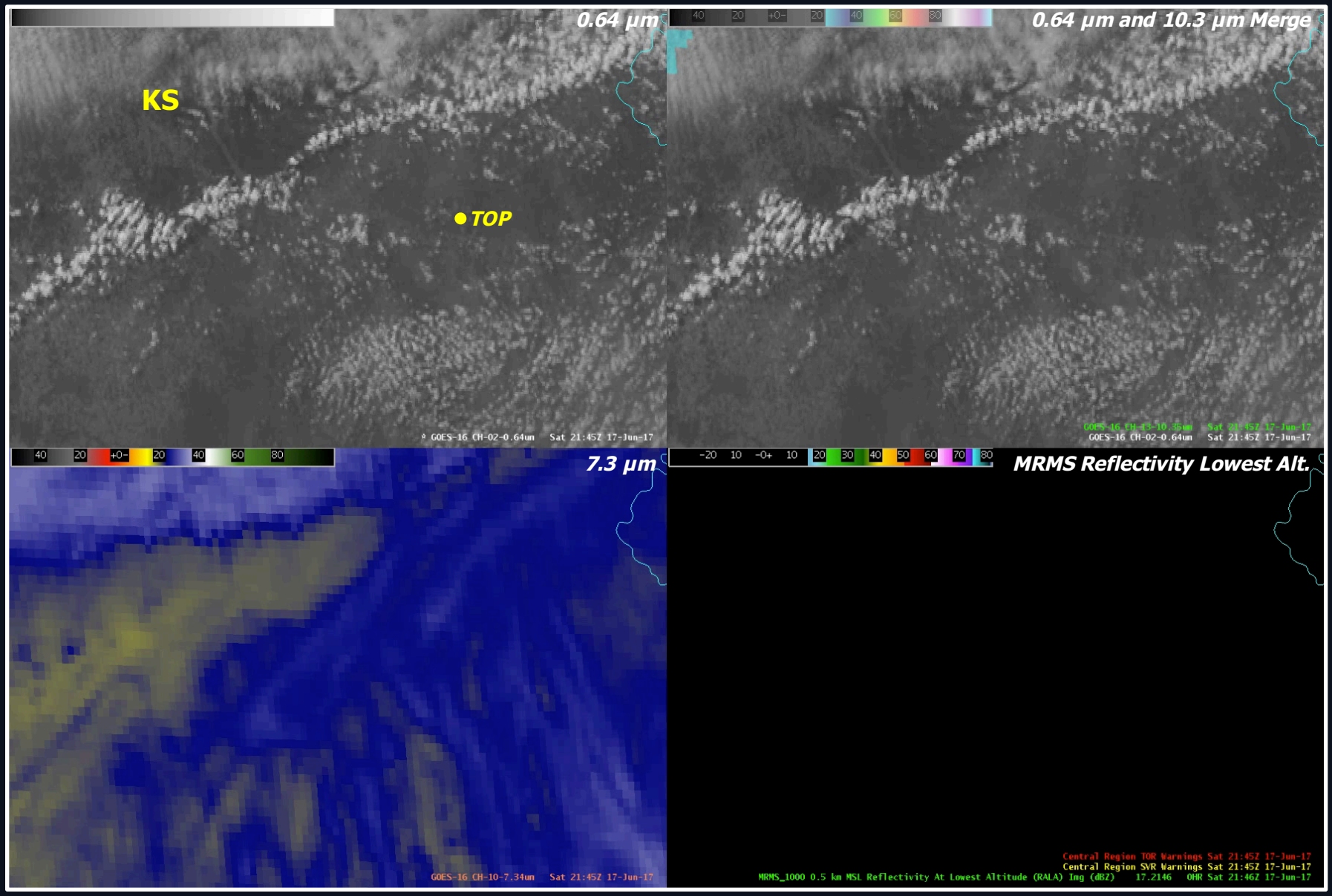
Monitoring Convection – 17 June 2017 2253-2342 UTC



Monitoring Convection – 17 June 2017 2100-2145 UTC



Monitoring Convection – 17 June 2017 2145-2245 UTC



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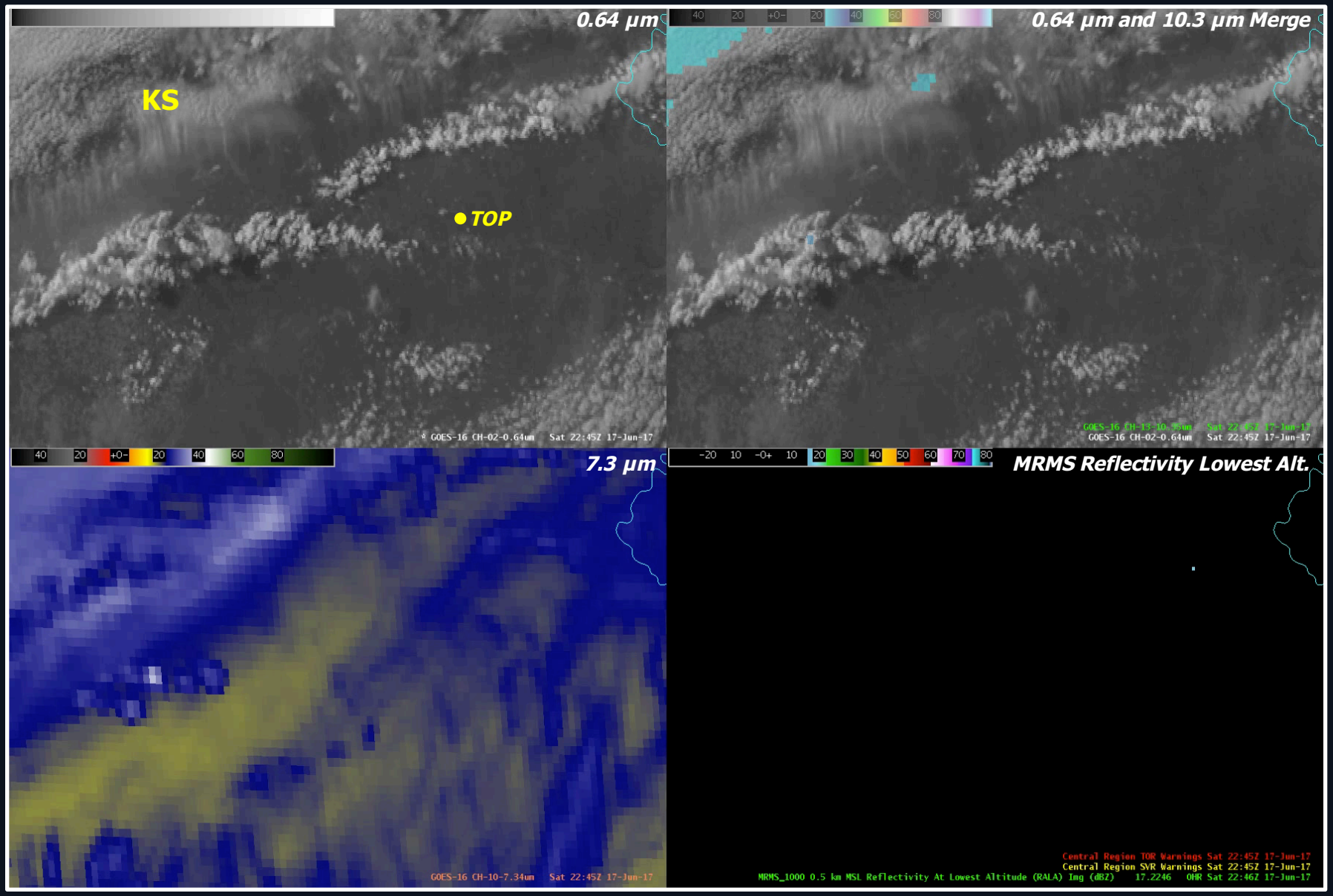
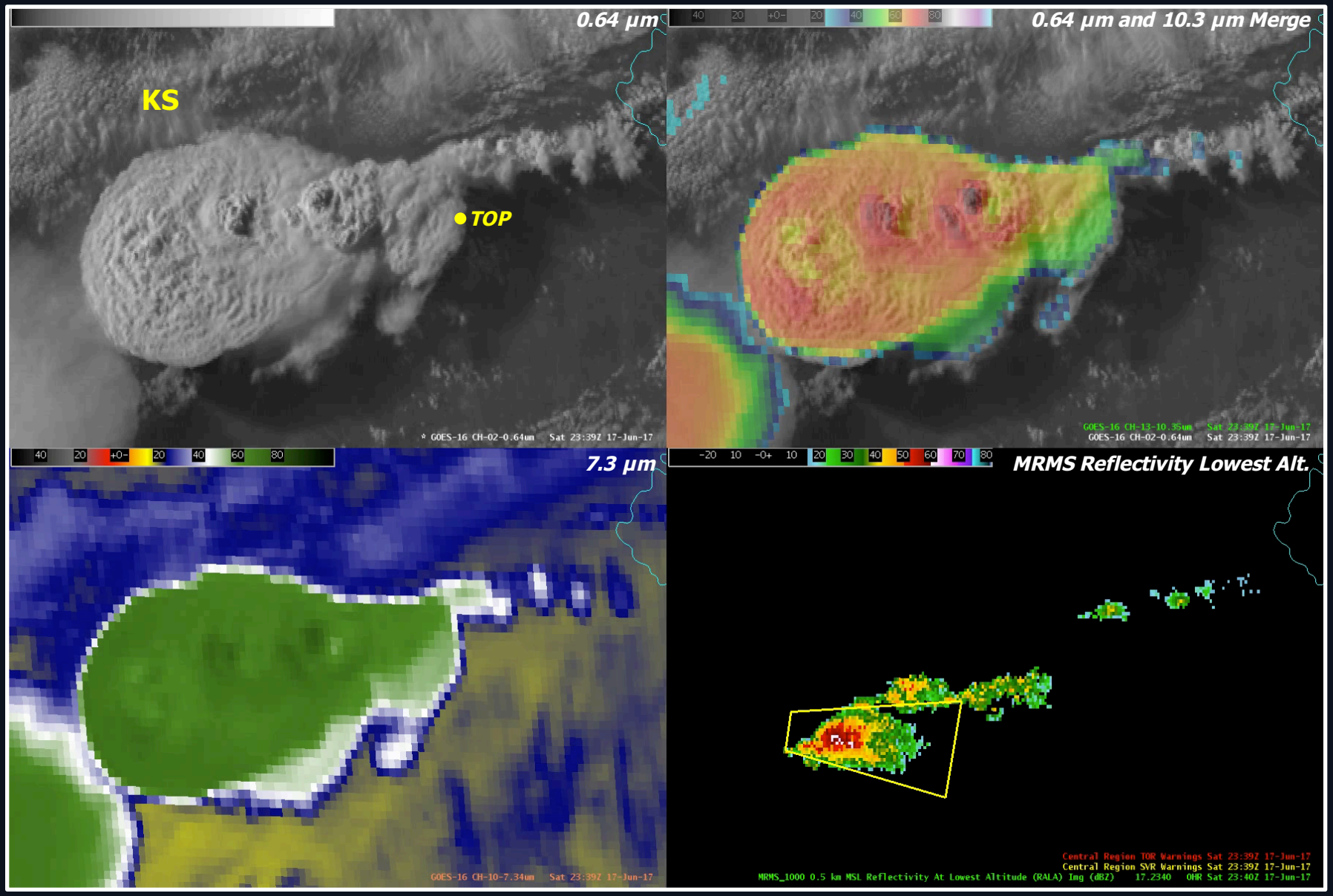
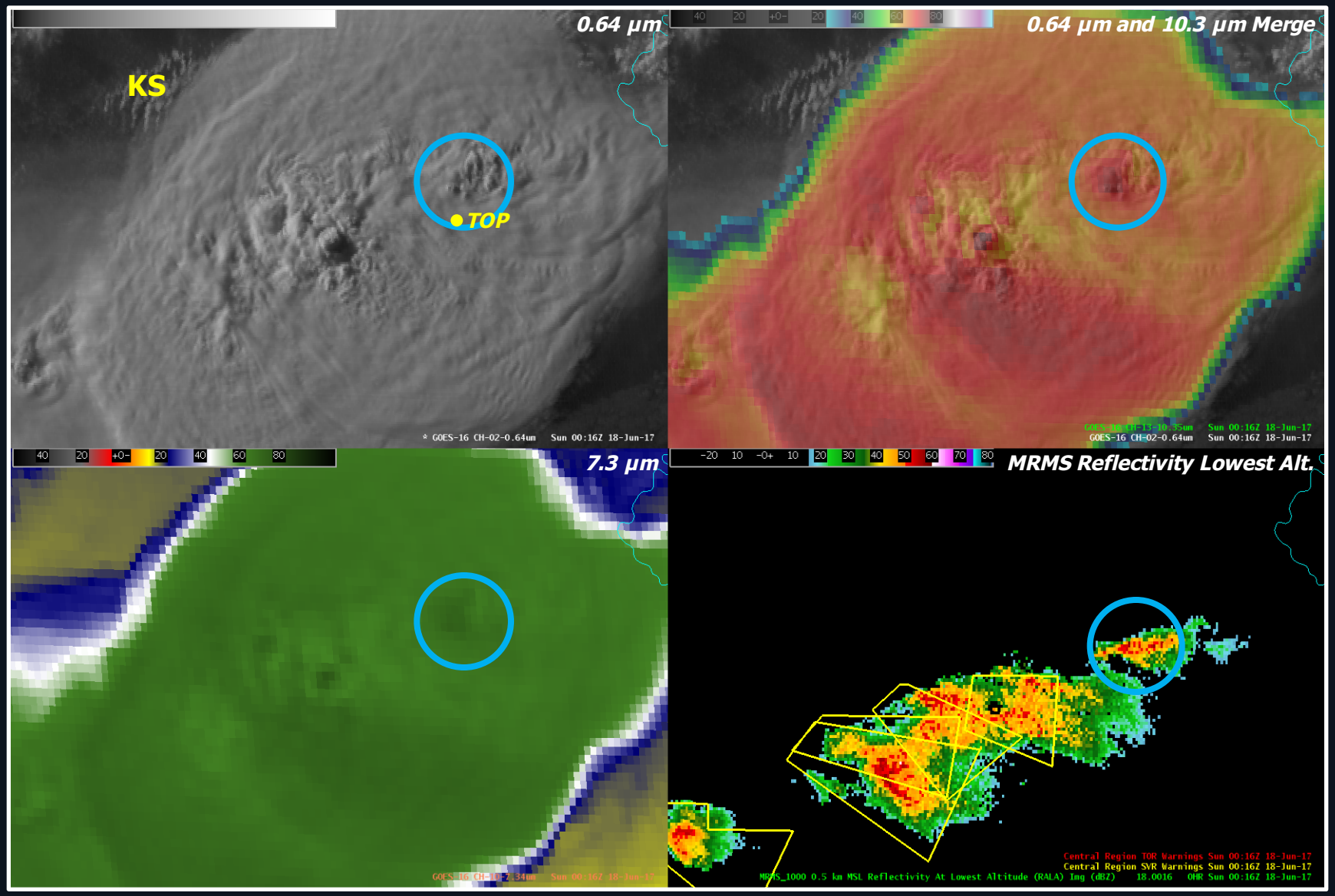


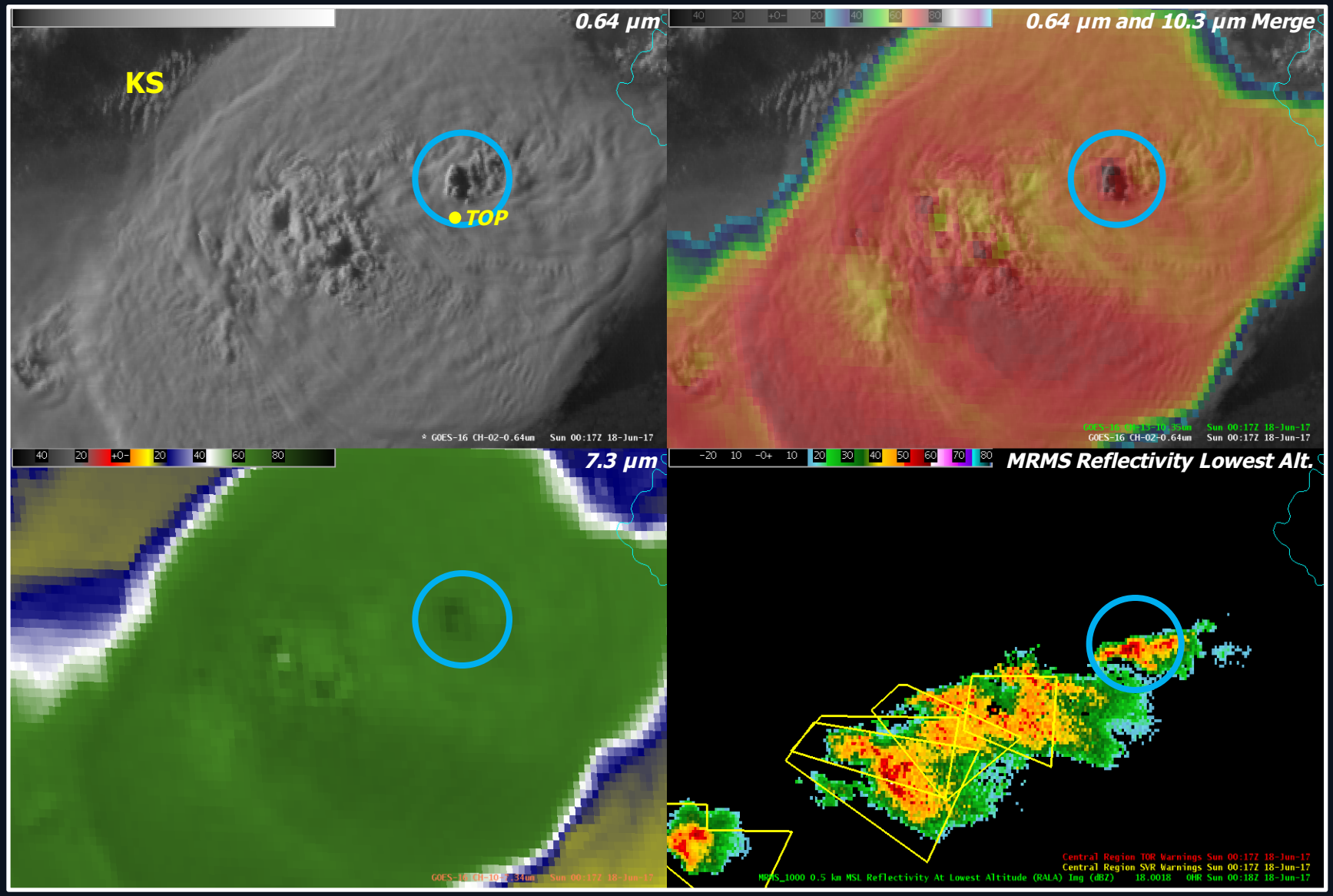
Monitoring Convection – 17-18 June 2017 2339-0017 UTC



Monitoring Convection – 18 June 2017 0016 UTC



Monitoring Convection – 18 June 2017 0017 UTC



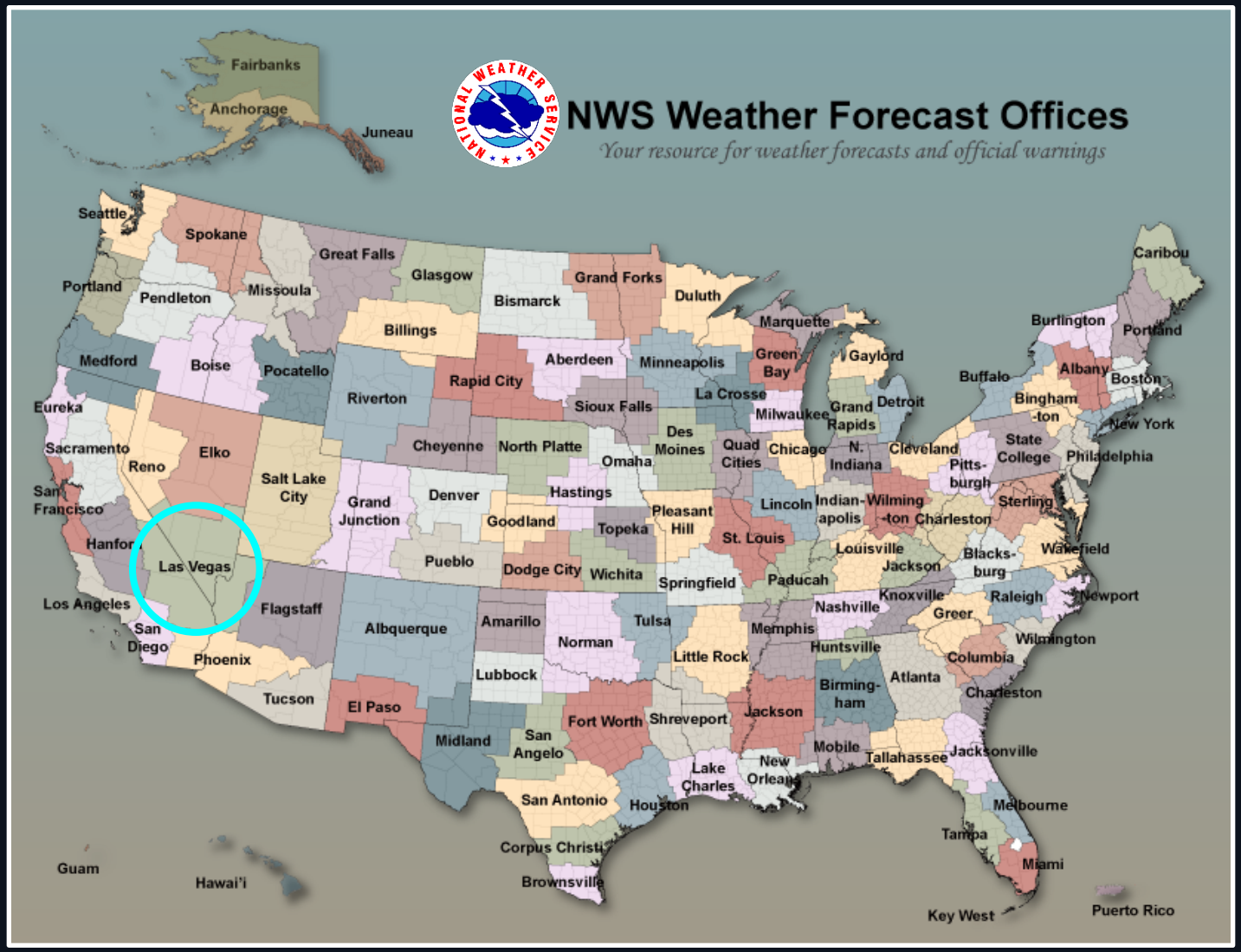
Monitoring Convection – NWS Feedback

"During convective events, 1-minute GOES-16 imagery allows for an at-a-glance analysis of which storms are growing at the fastest rate by watching for overshooting tops and rapid changes in cloud top cooling. This is much faster than using all tilts on radar or even composite reflectivity due to the increased temporal resolution of the satellite imagery. The key to successfully integrating 1-minute GOES-16 imagery into warning operations is to use the imagery in conjunction with radar data."

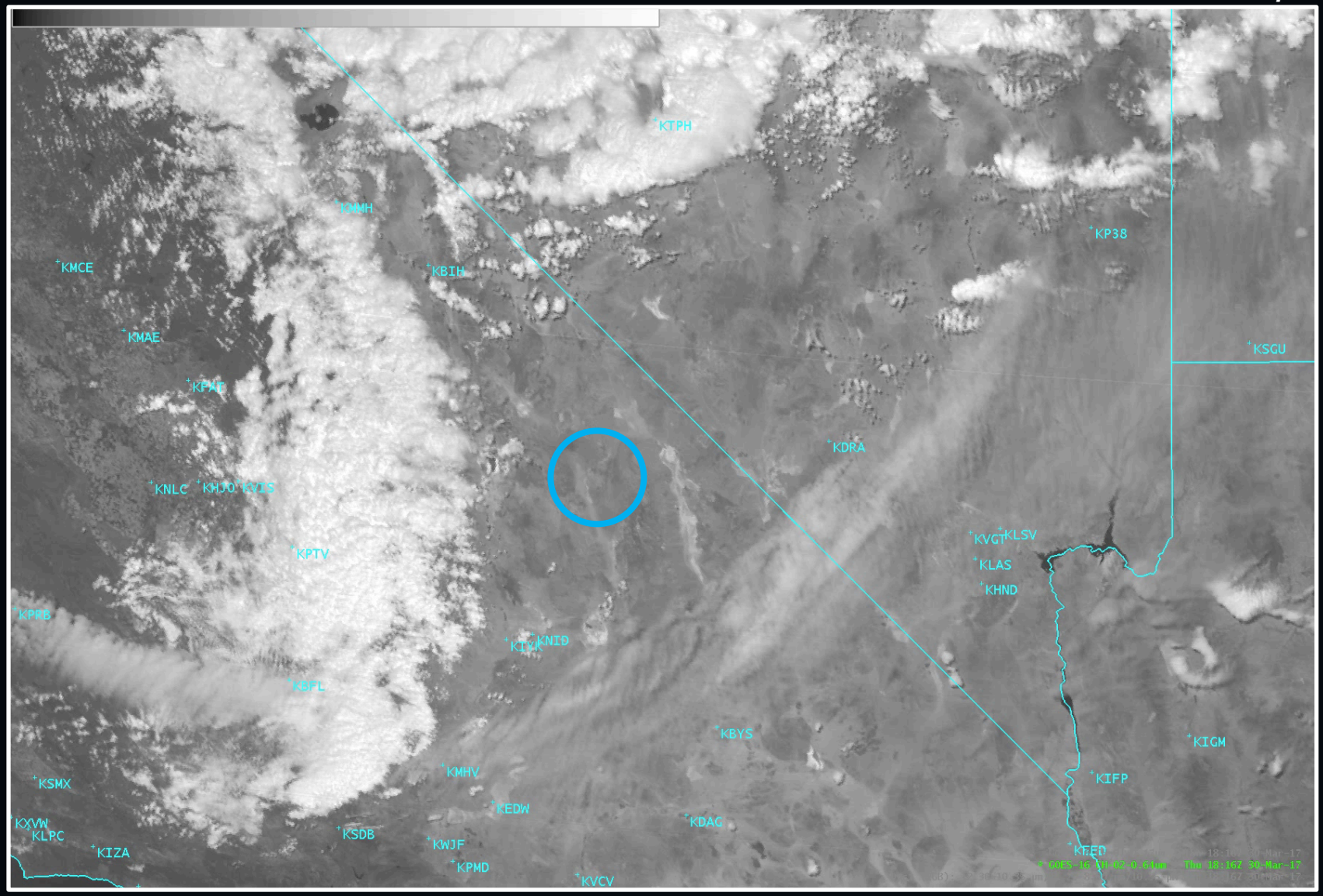
- Ryan Ellis
Forecaster, NWS WFO Raleigh, NC

Convective Initiation and Evolution Q&A Discussion

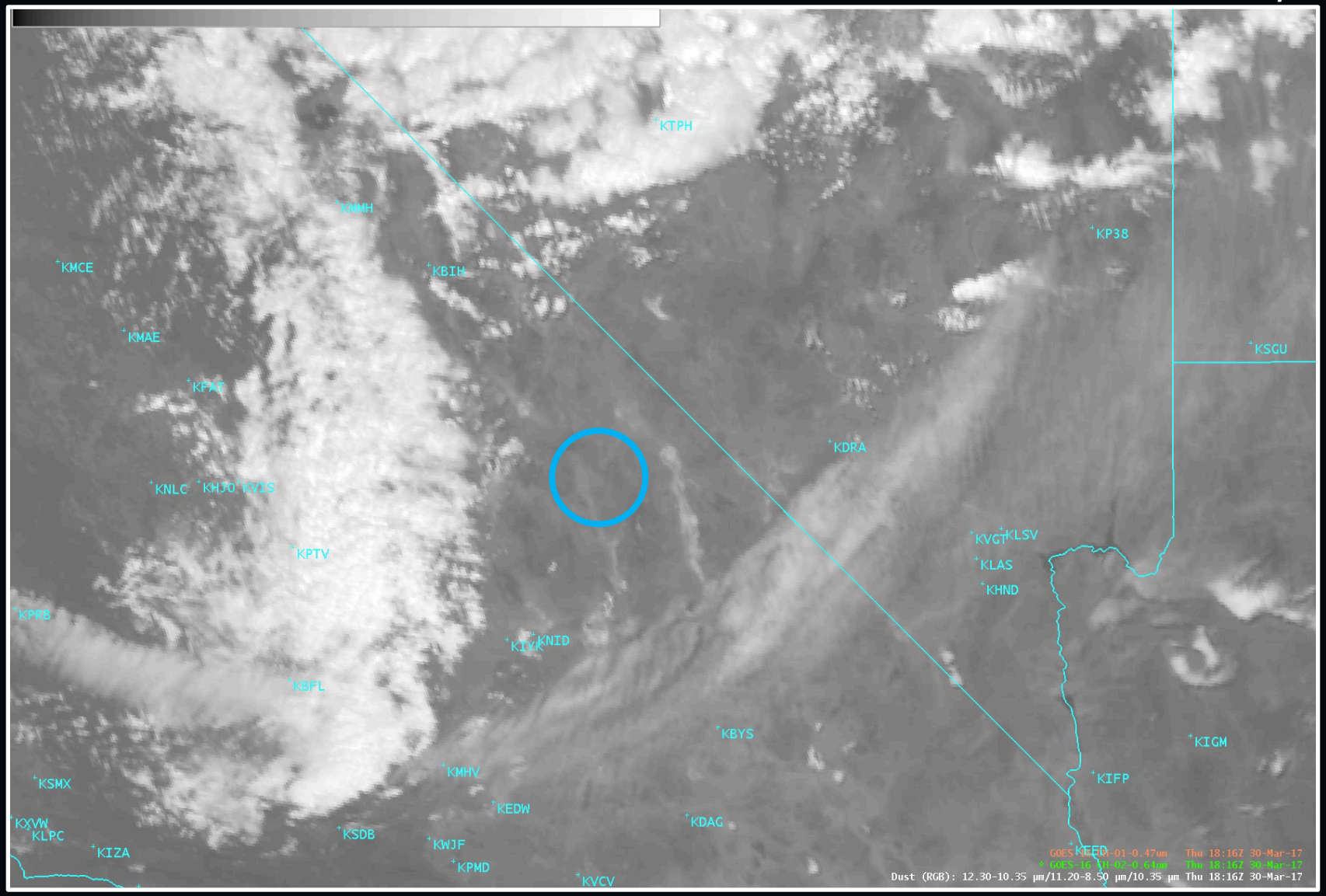
5. Dust Detection:
Las Vegas, NV NWS Forecast Office



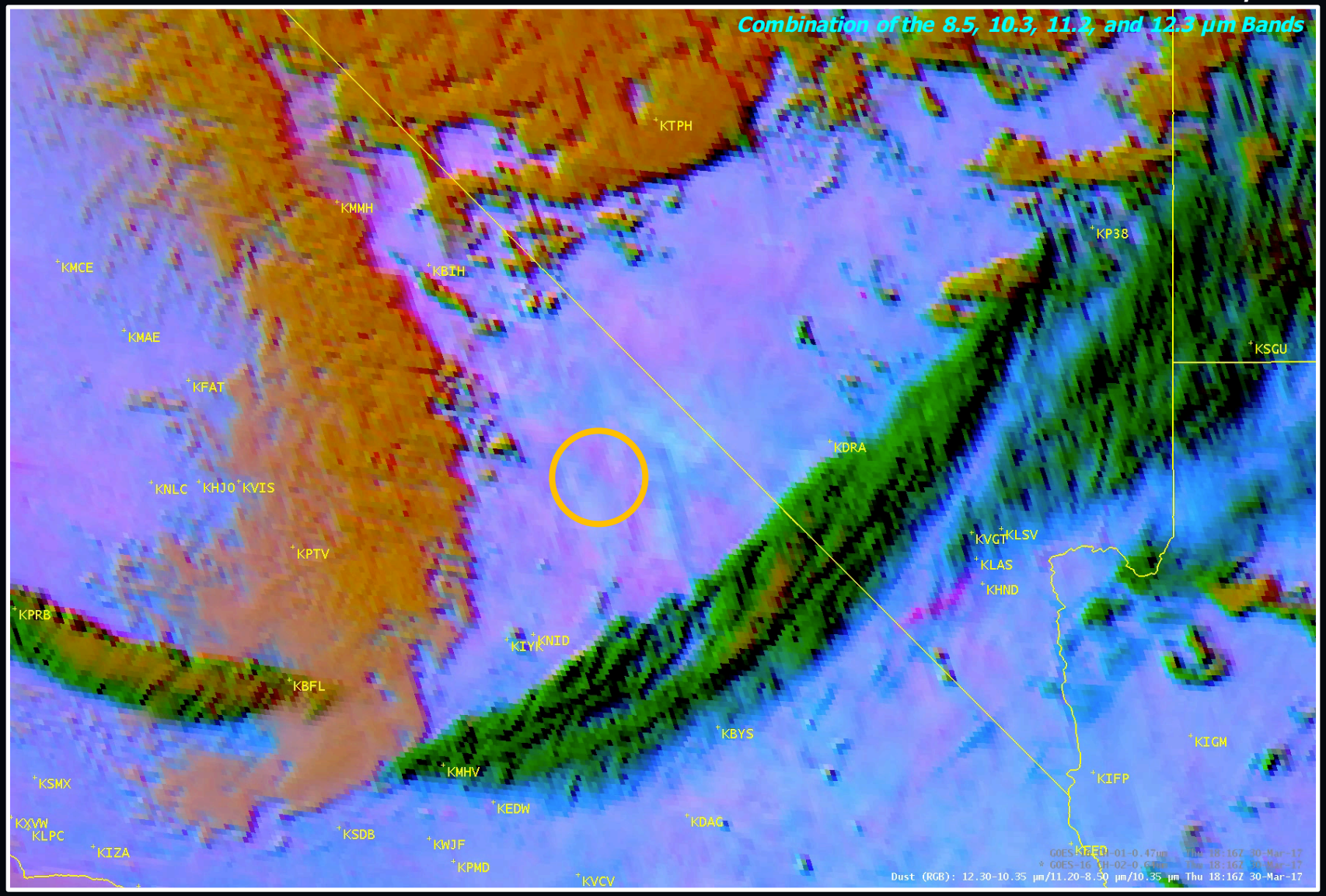
Dust Detection – 30 March 2017 1816-1911 UTC



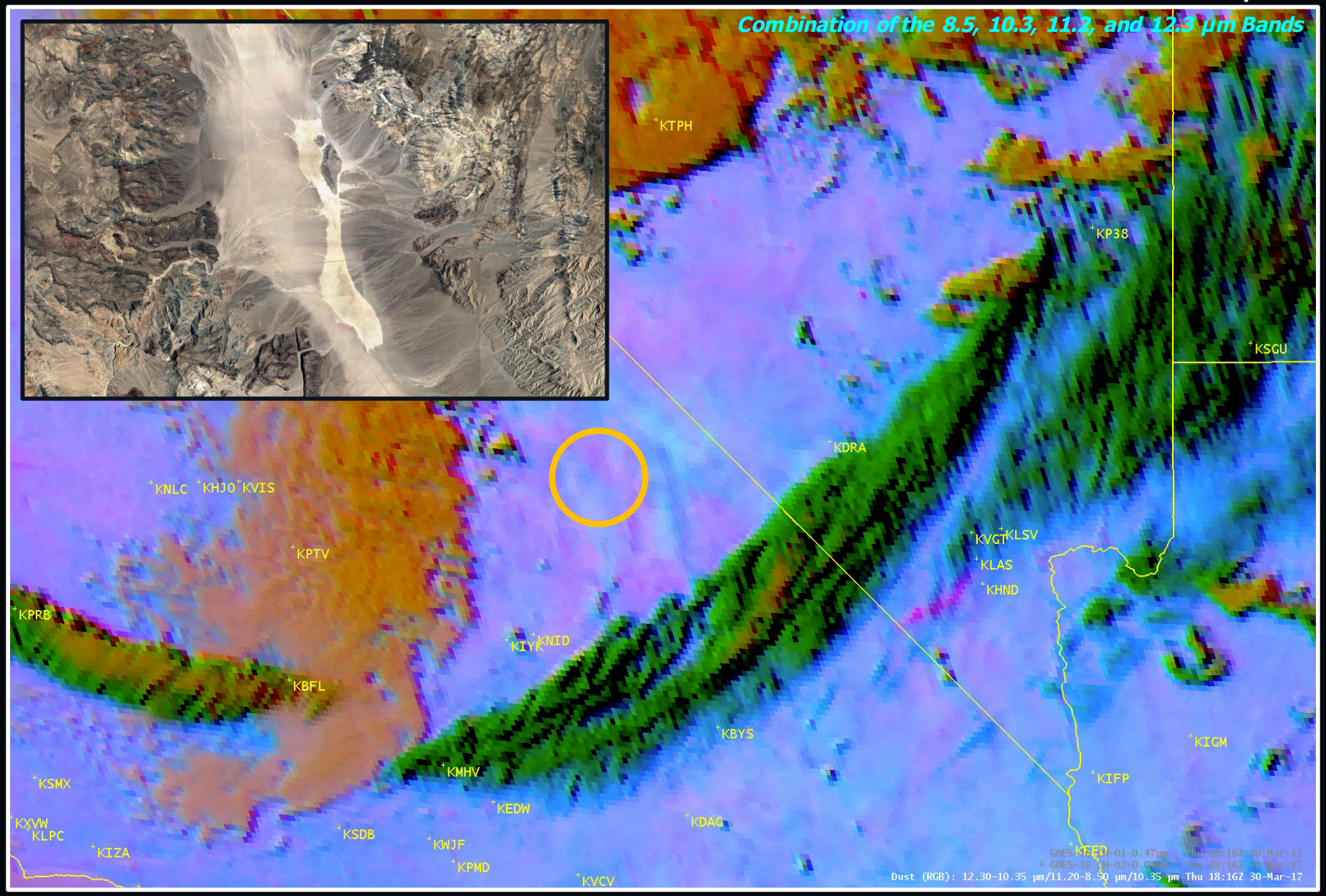
Dust Detection – 30 March 2017 1816-1911 UTC



Dust Detection – 30 March 2017 1816-1911 UTC



Dust Detection – 30 March 2017 1816-1911 UTC

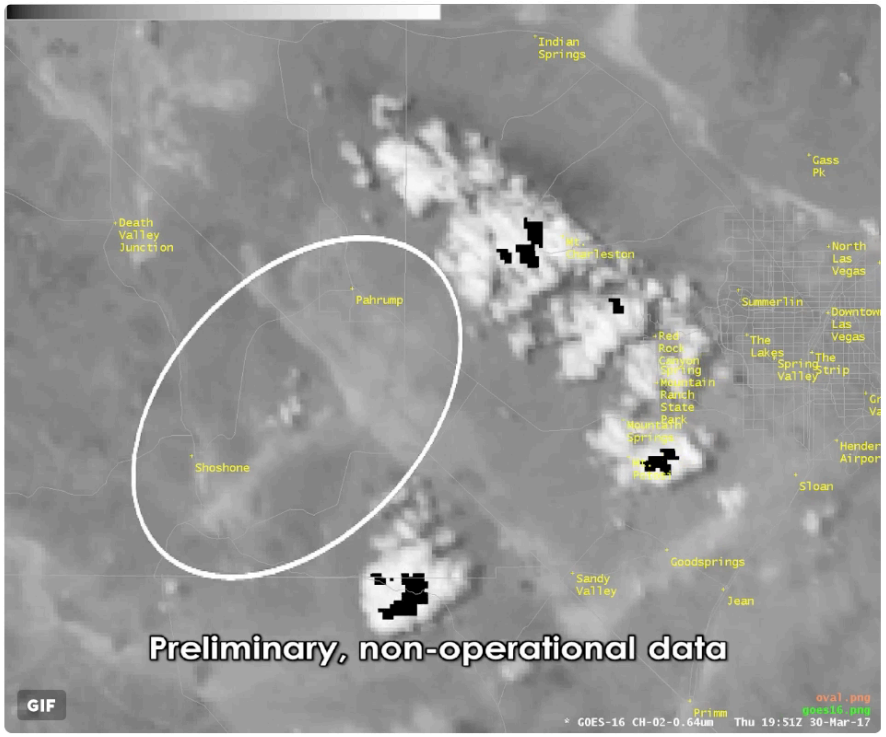


Dust Detection – 30 March 2017

NWS Las Vegas
@NWSVegas

Follow

Another area of blowing dust near Shoshone pushing into southern Nye County and into Pahrump, impacting travelers along Hwy 95.

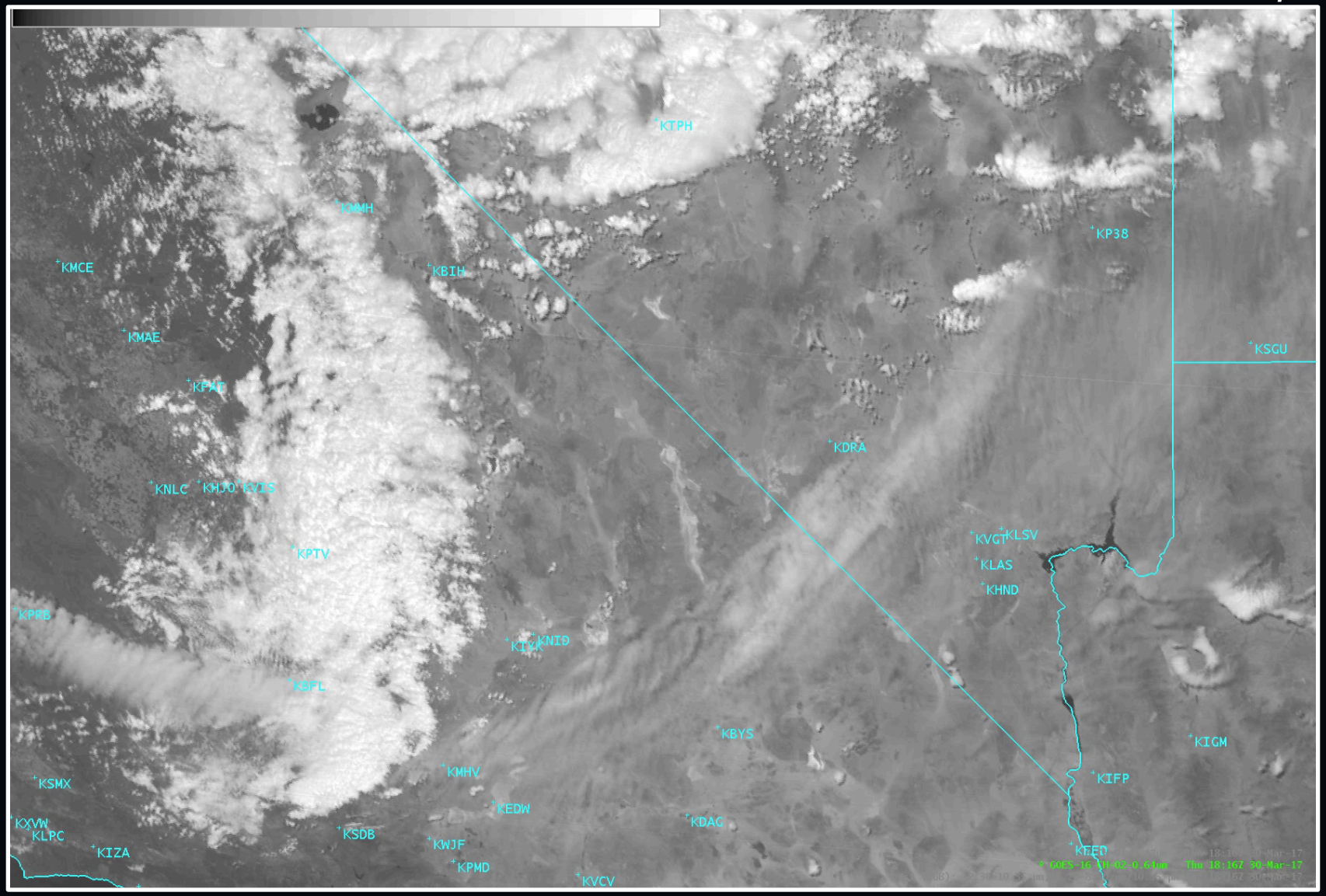


3:01 PM - 30 Mar 2017

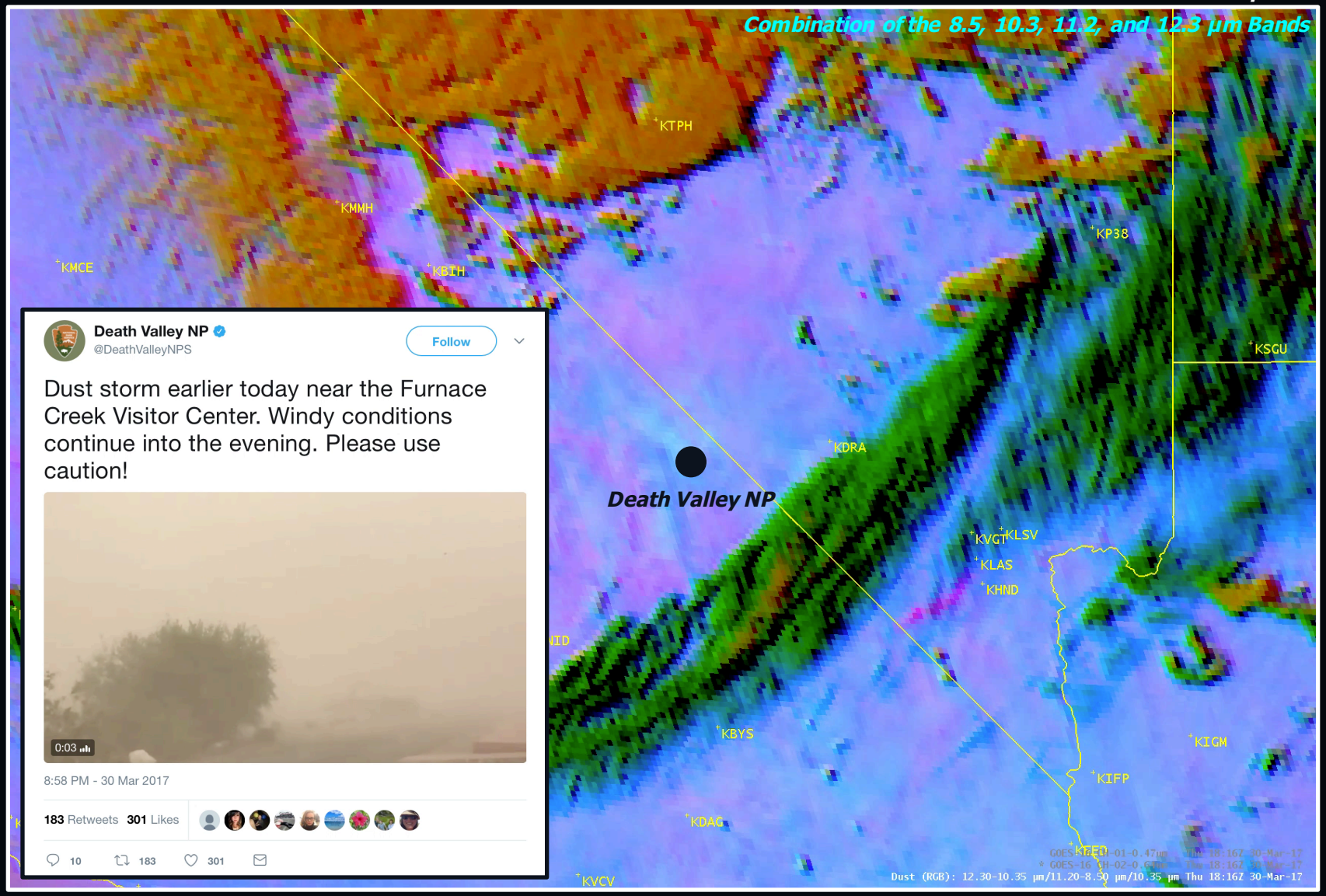
4 Retweets **6** Likes

4 6

Dust Detection – 30-31 March 2017 1816-0201 UTC



Dust Detection – 30-31 March 2017 1816-0201 UTC



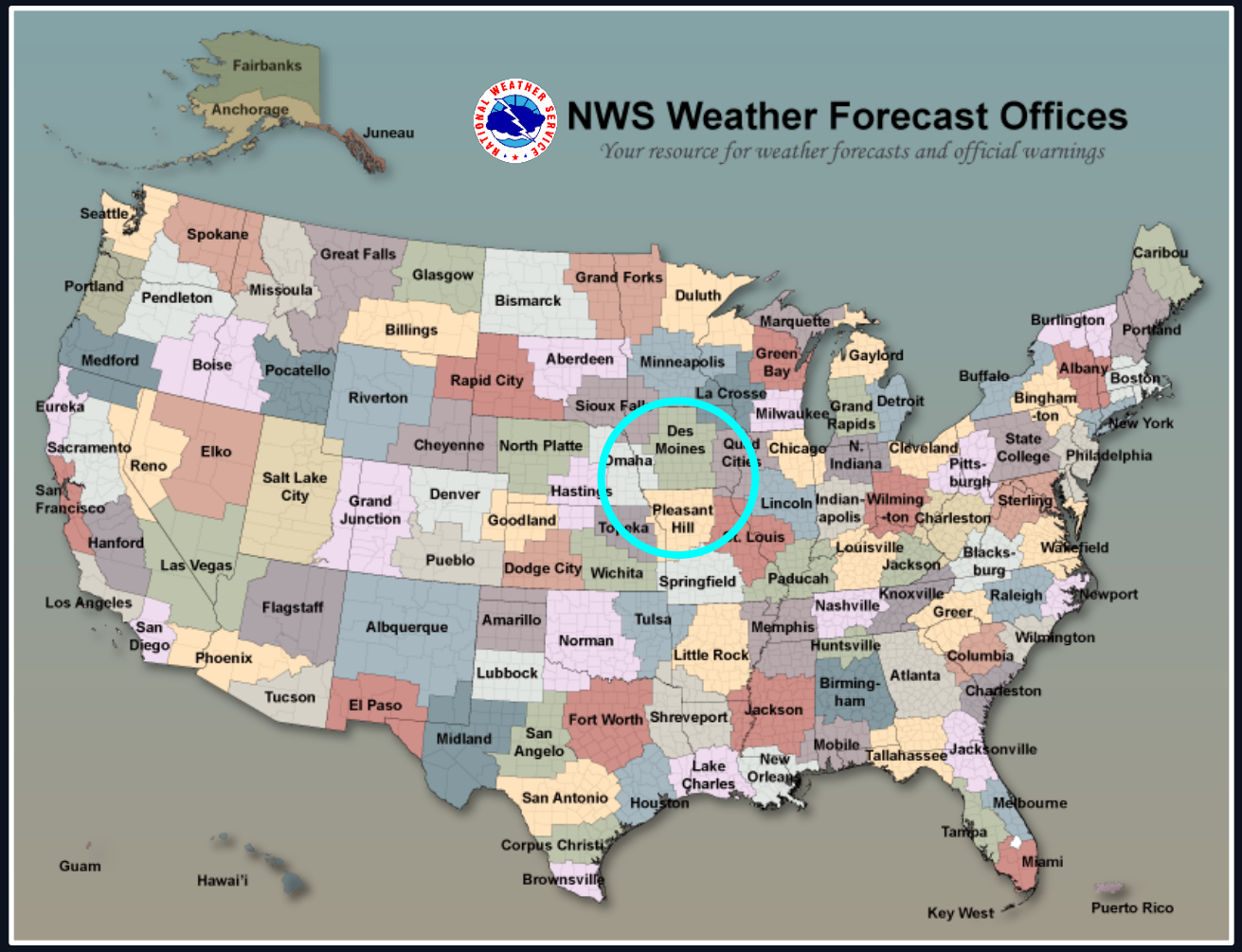
Dust Detection – 30 March 2017

"Dust is one of the most impactful weather types we get in the Southwestern United States. Visibility can drop from unrestricted to zero in seconds, which poses a tremendous risk for transportation on area highways and interstates. Being able to detect blowing dust is a challenge due to poor radar coverage of ground-based sensors. With its high spatial and temporal resolution, GOES-16 has the potential to fill-in those gaps while providing us with a significant increase in heads-up during these events."

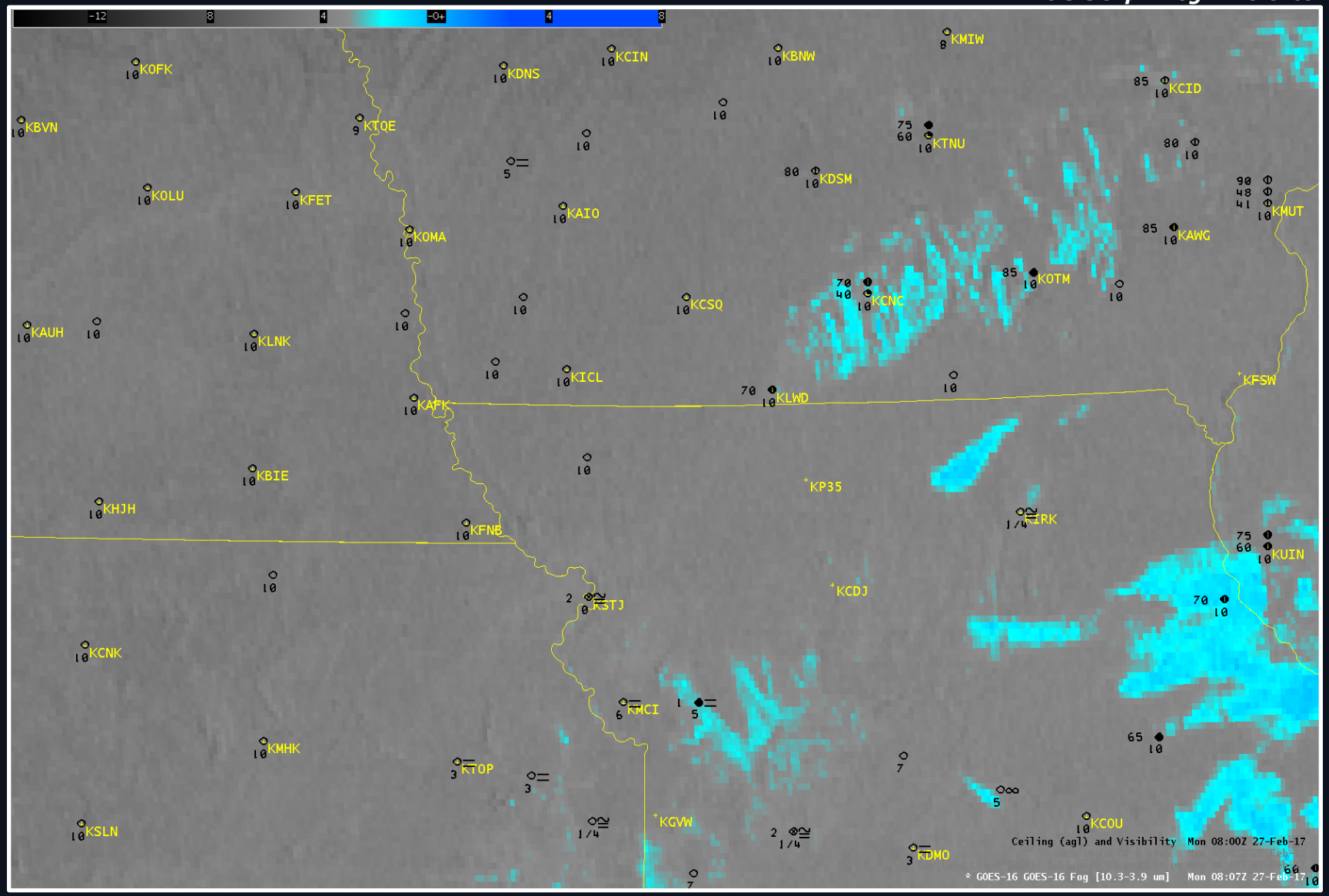
- Paul Iniguez
Science Operations Officer, NWS WFO Phoenix, AZ

Dust Detection
Q&A Discussion

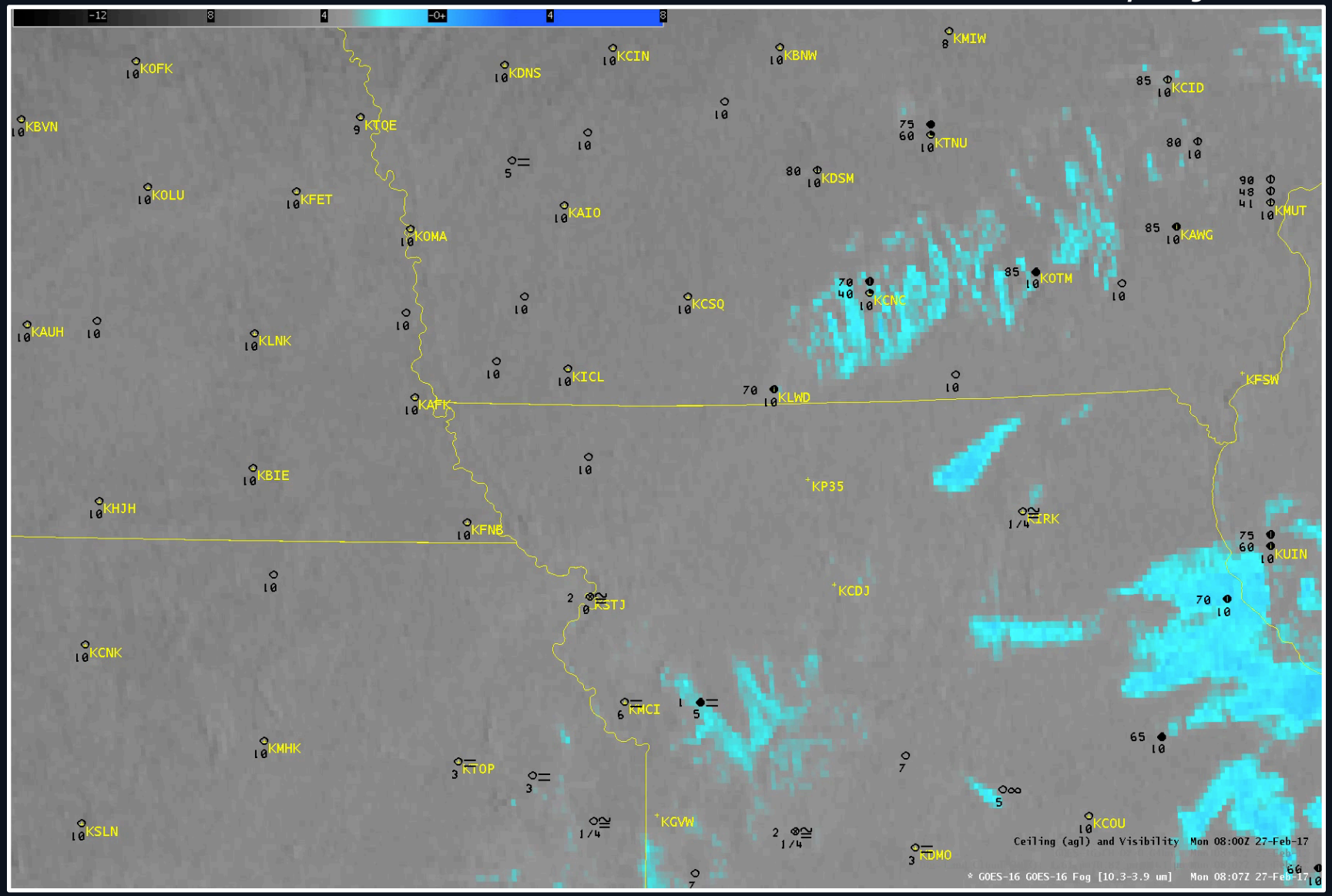
6. Fog and Low Stratus: Pleasant Hill, MO and Des Moines, IA NWS Forecast Offices



Fog and Low Stratus Detection – 27 February 2017 0807 UTC



Fog and Low Stratus Detection – 27 February 2017 0807-1247 UTC



Fog and Low Stratus Detection – 27 February 2017

Lindsey Anderson
@lnanderson

Following

Good morning! Fog is settling in around the KC metro. A neat view from our cam in #KCK.

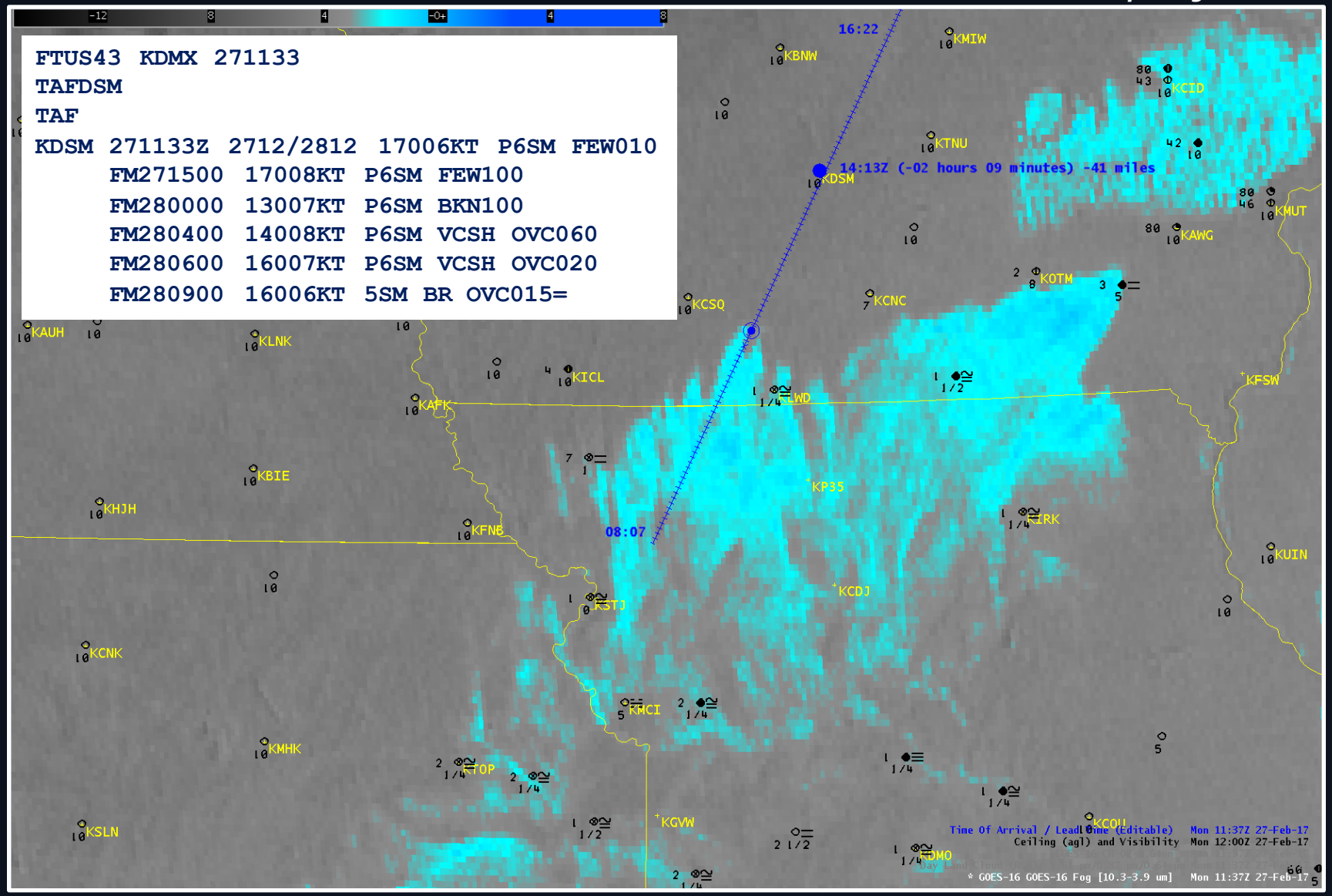
5:23 AM - 27 Feb 2017

6 Retweets **21** Likes

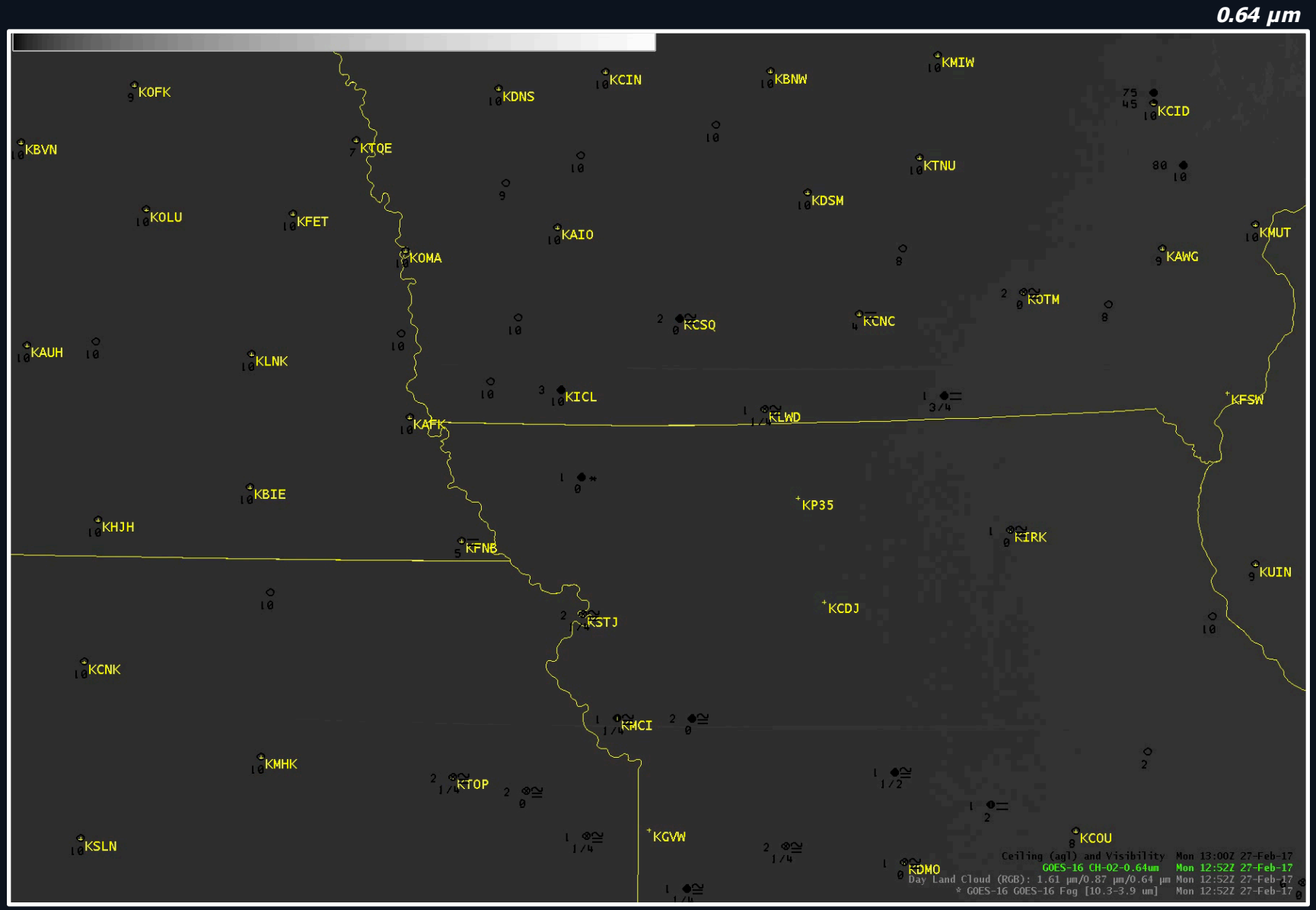
1 6 21

Fog and Low Stratus Detection – 27 February 2017 1137 UTC

10.3-3.9 µm Fog Difference

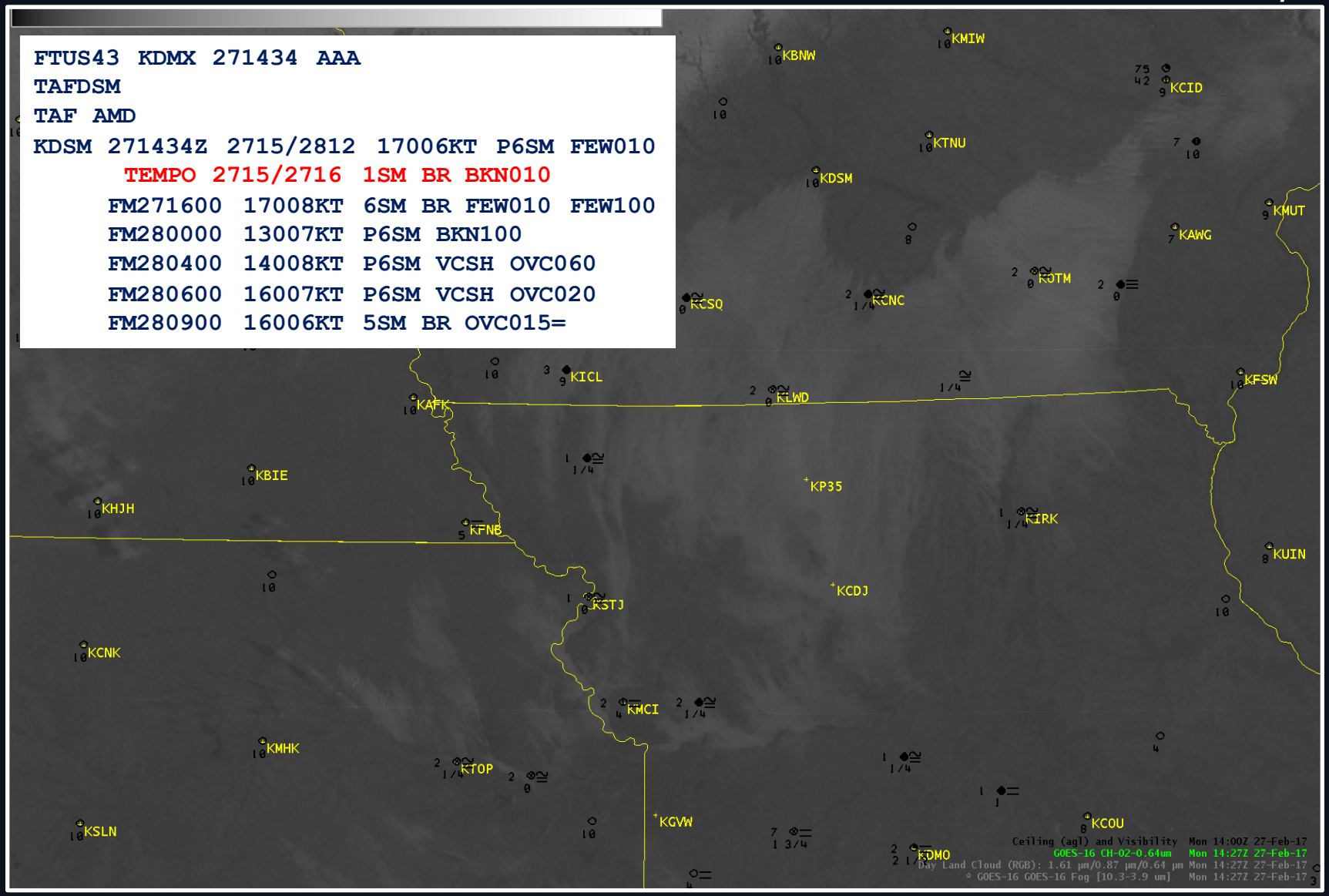


Fog and Low Stratus Detection – 27 February 2017 1252-1622 UTC



Fog and Low Stratus Detection – 27 February 2017 1427 UTC

0.64 µm



METAR KDSM 271425Z AUTO 19005KT 9SM CLR A3004

Fog and Low Stratus Detection – NWS Feedback

"Receiving GOES-16 imagery every 5 minutes is extremely helpful to gather trends with fog and low clouds. This helps to ensure TAFs are up-to-date with impacts that affect our aviation customers. In addition, I can also refine our public forecasts to better reflect trends in fog or low clouds in the absence of surface observations."

- Andrew Ansorge
Forecaster, NWS WFO Des Moines, IA

Fog and Low Stratus
Q&A Discussion

Final
Q&A Discussion

Many thanks to…

Matt Foster (OPG)
Dan Lindsey (NESDIS/STAR/CIRA)
Andrew Orrison (NCEP/WPC)
Joe Zajic (NWS/TOWR-S)